



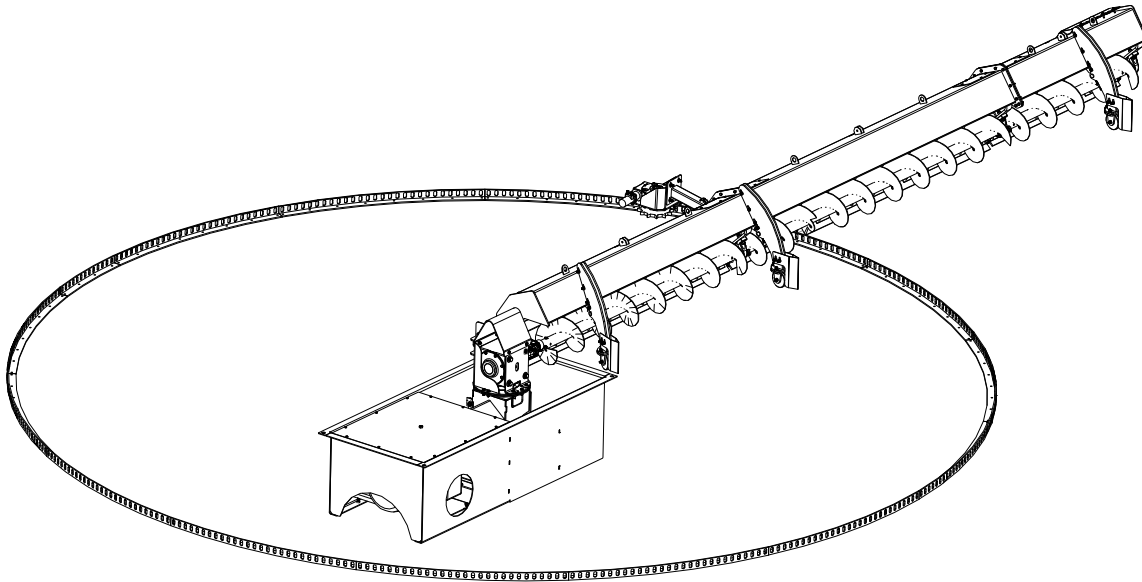
Hi-Flow 500 Series with Control Panel

Commercial Bin Sweep Assembly Manual

This manual applies to the following models:

BU-16-48, BU-16-48EX, BU-16-54, BU-16-54EX,
BU-16-60, BU-16-60EX, BU-16-66, BU-16-66EX,
BU-16-72, BU-16-72EX, BU-16-75, BU-16-75EX,
BU-16-90, BU-16-90EX, BU-16-105, BU-16-105EX

Original Instructions



Read this manual before using product. Failure to follow instructions and safety precautions can result in serious injury, death, or property damage. Keep manual for future reference.

Part Number: 1052104 R0

Revised: March 2020

New in this Manual

The following changes have been made in this revision of the manual:

Description	Section
Updated hardware description and part number.	various sections
Modified manual format.	All sections

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1. Introduction

This manual describes how to assemble a AGI Commercial Bin Sweep.

Before assembling, please read this manual. Familiarize yourself with the process and the necessary precautions for efficient and safe assembly.

Everyone present at the assembly site is required to be familiar with all safety precautions.

Keep this manual available for frequent reference and review it with new personnel. Call your local distributor or dealer if you need assistance or additional information.

2. Safety

2.1. Safety Alert Symbol and Signal Words



This safety alert symbol indicates important safety messages in this manual. When you see this symbol, be alert to the possibility of injury or death, carefully read the message that follows, and inform others.

Signal Words: Note the use of the signal words **DANGER**, **WARNING**, **CAUTION**, and **NOTICE** with the safety messages. The appropriate signal word for each message has been selected using the definitions below as a guideline.



Indicates an imminently hazardous situation that, if not avoided, will result in serious injury or death.



Indicates a hazardous situation that, if not avoided, could result in serious injury or death.



Indicates a hazardous situation that, if not avoided, may result in minor or moderate injury.



Indicates a potentially hazardous situation that, if not avoided, may result in property damage.

2.2. General Safety

It is the bin sweep assembler and installation personnel's responsibility to read and understand **ALL** safety instructions, safety decals, and manuals and follow them when assembling, operating, or maintaining the equipment.

- Only experienced personnel who are familiar with this type of assembly and installation should perform this work. Untrained assemblers/installers expose themselves and bystanders to possible serious injury or death.
- Do not modify the bin sweep in any way without written permission from the manufacturer. Unauthorized modification may impair the function and/or safety. Any unauthorized modification will void the warranty.
- Follow a health and safety program for your worksite. Contact your local occupational health and safety organization for information.
- Contact your local representative or AGI if you need assistance or additional information.



2.3. Rotating Flighting Safety

DANGER

- KEEP AWAY from rotating flighting.
- DO NOT remove or modify flighting guards, doors, or covers. Keep in good working order. Have replaced if damaged.
- DO NOT operate the bin sweep without all guards, doors, and covers in place.
- NEVER touch the flighting. Use a stick or other tool to remove an obstruction or clean out.
- Shut off and lock out power to adjust, service, or clean.



2.4. Rotating Parts Safety

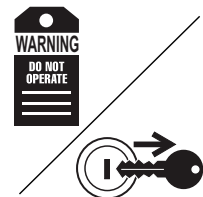
WARNING

- Keep body, hair, and clothing away from rotating pulleys, belts, chains, and sprockets.
- Do not operate with any guard removed or modified. Keep guards in good working order.
- Shut off and remove key or lock out power source before inspecting or servicing machine.



2.5. Drives and Lockout Safety

Inspect the power source(s) before using and know how to shut down in an emergency. Whenever you service or adjust your equipment, make sure you shut down the power source and follow lockout and tagout procedures to prevent inadvertent start-up and hazardous energy release. Know the procedure(s) that applies to your equipment from the following power source(s). Ensure that only 1 key exists for each assigned lock, and that you are the only one that holds that key. Ensure that all personnel are clear before turning on power to equipment.



2.5.1 Electric Motor Safety



WARNING

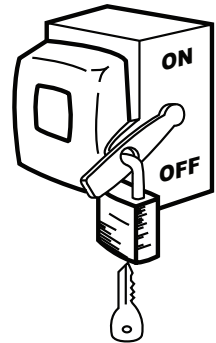
Power Source

- Electric motors and controls shall be installed and serviced by a qualified electrician and must meet all local codes and standards.
- A magnetic starter should be used to protect your motor.
- You must have a manual reset button.
- Reset and motor starting controls must be located so that the operator has full view of the entire operation.
- Locate main power disconnect switch within reach from ground level to permit ready access in case of an emergency.
- Motor must be properly grounded.
- Ensure electrical wiring and cords remain in good condition; replace if necessary.

Lockout

- The main power disconnect switch should be in the locked position during shutdown or whenever maintenance is performed.
- If reset is required, disconnect all power **before** resetting motor.

SERVICE DISCONNECT



2.5.2 Hydraulic Power Safety

WARNING Power Source

- Refer to the rules and regulations applicable to the power source operating your hydraulic drive.
- Do not connect or disconnect hydraulic lines while system is under pressure.
- Keep all hydraulic lines away from moving parts and pinch points.
- Escaping hydraulic fluid under pressure will cause serious injury if it penetrates the skin surface (serious infection or toxic reaction can develop). See a doctor immediately if injured.
- Use metal or wood as a backstop when searching for hydraulic leaks and wear proper hand and eye protection.
- Check all hydraulic components are tight and in good condition. Replace any worn, cut, abraded, flattened, or crimped hoses.
- Clean the connections before connecting to equipment.
- Do not attempt any makeshift repairs to the hydraulic fittings or hoses with tape, clamps, or adhesive. The hydraulic system operates under extremely high pressure; such repairs will fail suddenly and create a hazardous and unsafe condition.

Lockout

- Always place all hydraulic controls in neutral and relieve system pressure before disconnecting or working on hydraulic system.



2.6. Personal Protective Equipment

The following Personal Protective Equipment (PPE) should be worn when assembling the equipment.

Safety Glasses

- Wear safety glasses at all times to protect eyes from debris.



Work Gloves

- Wear work gloves to protect your hands from sharp and rough edges.



Steel-Toe Boots

- Wear steel-toe boots to protect feet from falling debris.

**Coveralls**

- Wear coveralls to protect skin.

**Hard Hat**

- Wear a hard hat to help protect your head.



2.7. Safety Equipment

The following safety equipment should be kept on site:

Fire Extinguisher

- Provide a fire extinguisher for use in case of an accident. Store in a highly visible and accessible place.

**First-Aid Kit**

- Have a properly-stocked first-aid kit available for use should the need arise, and know how to use it.



2.8. Safety Decals

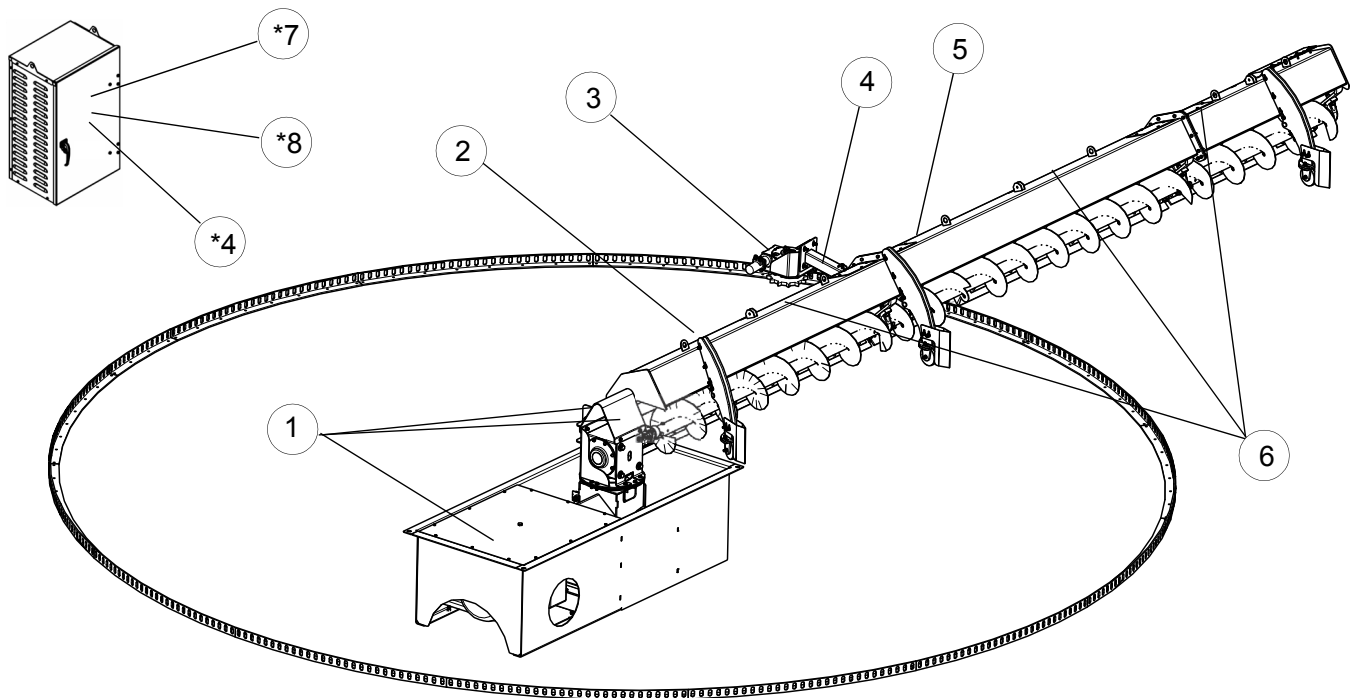
- Keep safety decals clean and legible at all times.
- Replace safety decals that are missing or have become illegible. See decal location figures that follow.
- Replaced parts must display the same decal(s) as the original part.
- Replacement safety decals are available **free of charge** from your distributor, dealer, or factory as applicable.

2.8.1 Decal Installation/Replacement

1. Decal area must be clean and dry, with a temperature above 50°F (10°C).
2. Decide on the exact position before you remove the backing paper.
3. Align the decal over the specified area and carefully press the small portion with the exposed sticky backing in place.
4. Slowly peel back the remaining paper and carefully smooth the remaining portion of the decal in place.
5. Small air pockets can be pierced with a pin and smoothed out using the sign backing paper.

2.8.2 Safety Decal Locations and Details

Replicas of the safety decals that are attached to the bin sweep and their messages are shown in the figure(s) that follow. Safe operation and use of the bin sweep requires that you familiarize yourself with the various safety decals and the areas or particular functions that the decals apply to, as well as the safety precautions that must be taken to avoid serious injury, death, or damage.



Note

*Decals located on inside of the hydraulic power supply housing door. Representation shown above not to scale and not shown in exact placement.

Table 1. Safety Decals




Item	Description	Part Number
1	 <p>FALL AND ENTANGLEMENT HAZARDS</p> <p>Approaching open pit while unloading system is operating can result in SERIOUS INJURY or DEATH:</p> <ul style="list-style-type: none"> • Keep FAR away from center sump. • Approach slowly and cautiously. Stored grain can cause slips or trips. • LOCK OUT all power sources before entering bin. 	BU-0500418
2		BU-0000003
3	 <p>ENTANGLEMENT HAZARD</p> <ul style="list-style-type: none"> • Keep away from track drive gear. • Shut off and lock out power before inspecting or servicing. 	BU-0500420

Table 1 Safety Decals (continued)

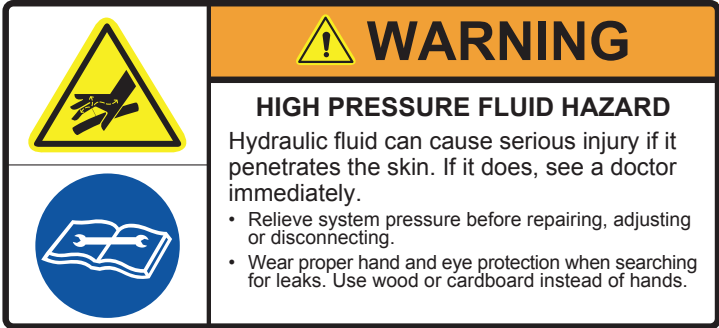

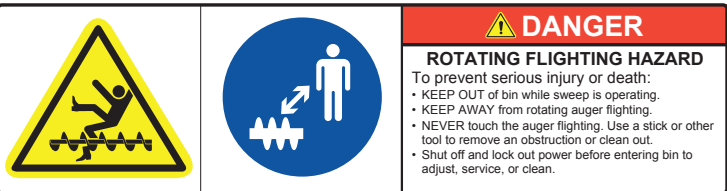
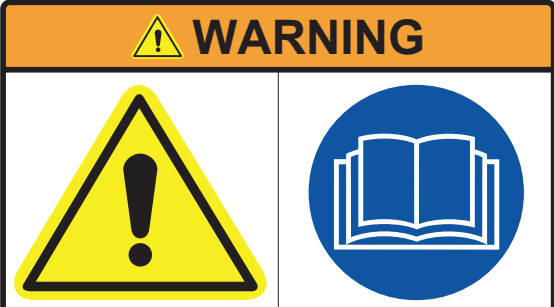

Item	Description	Part Number
4		BU-0500422
5		BU-0500419
6		BU-0100470 (one placed on every backboard section)

Table 1 Safety Decals (continued)

Item	Description	Part Number
7	<div data-bbox="310 273 860 1102">  <p>To prevent serious injury or death:</p> <ul style="list-style-type: none"> • Read and understand the manual before assembling, operating, or maintaining the equipment. • Only trained personnel may assemble, operate, or maintain the equipment. • Children and untrained personnel must be kept outside of the work area. • Do not modify the equipment. Keep in good working order. • Lock out power before performing maintenance. • If the manual, guards, or decals are missing or damaged, contact factory or representative for free replacements. </div>	BU-0020807
8	<div data-bbox="310 1150 860 1417"> <p><i>Designation:</i> <i>Year of construction:</i></p> <p>CE  II 3D T113°C</p> <p><i>Manufactured by:</i> AGI Clay Center, 514 W. Crawford Street Clay Center, KS, 67432, USA</p> <p><i>EU Authorized Representative:</i> AGI-PTM, Via Mario Tognato, 10-35042 Este (PD), Italy</p> </div>	BU-0500417

3. Features

This section covers the main features of the bin sweep.

Figure 1. Typical Commercial Bin Sweep

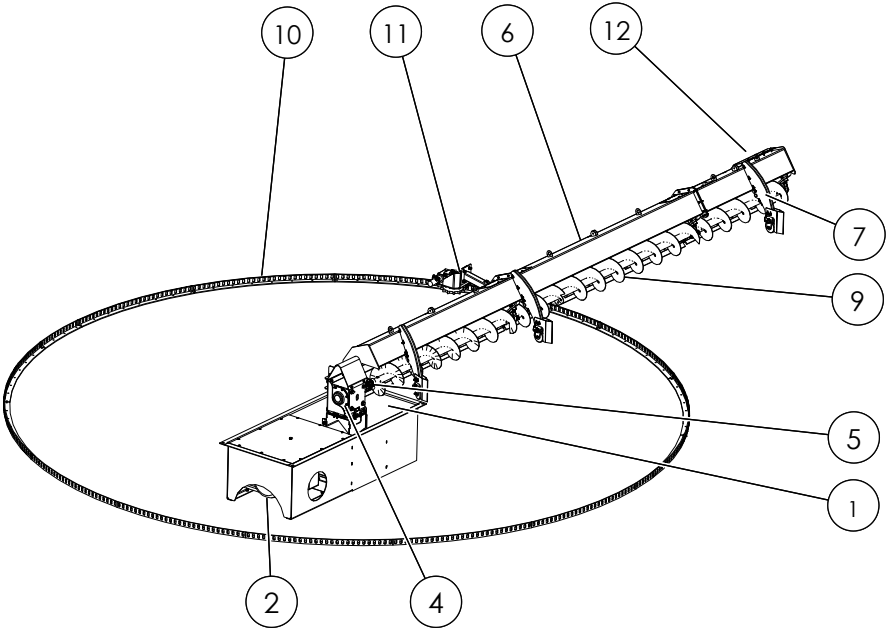


Figure 2. Open View of Center Sump

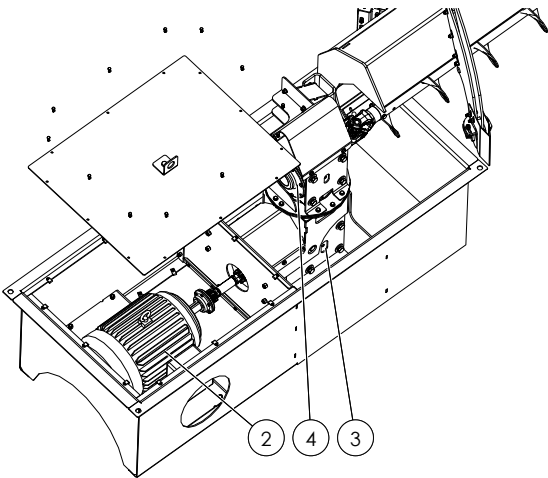


Figure 3. Rear View of Sweep

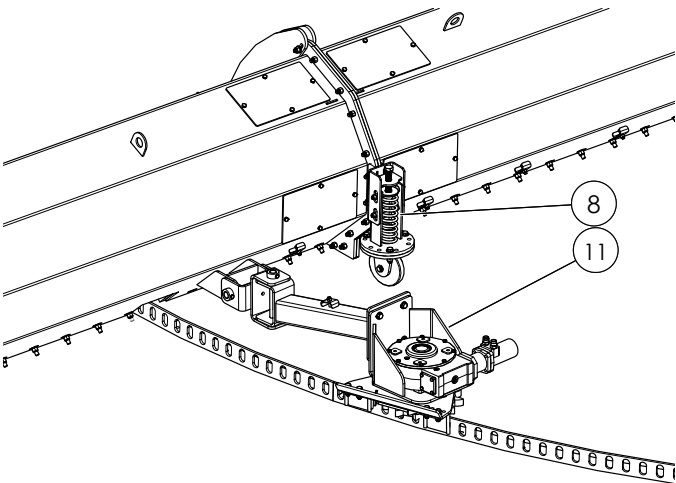
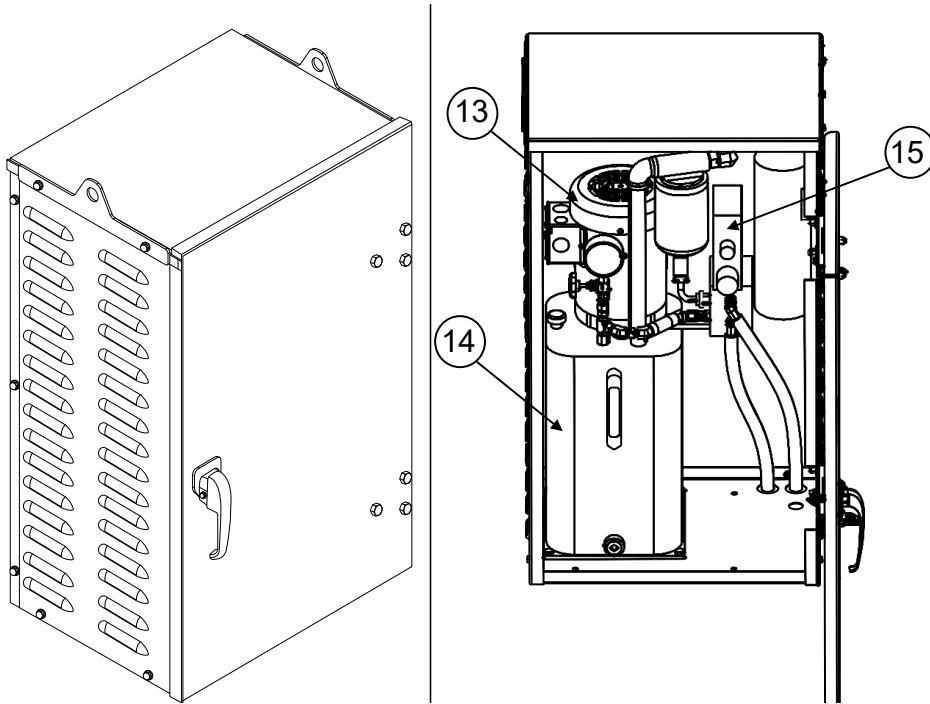


Figure 4. Housed Hydraulic Power Supply**Table 2. Features**

Item	Description
1	Center Sump
2	Electric Motor (in enclosure in center sump)
3	Lower Gearbox
4	Upper Gearbox
5	Universal Joint
6	Backboard
7	Front Wheel Sub-assembly

Item	Description
9	Flighting
10	Angle Drive Track
11	Track Drive (includes hydraulic motor, gearbox, and toothed wheel)
12	Sweep Extender
13*	Electric Motor
14*	Hydraulic Oil Tank (and Hydraulic Pump inside)
15*	Proportional Directional Flow Control Valve

*All housed within Hydraulic Power Supply.

Functional Overview

The Commercial Bin Sweep functions using helical flighting to transfer grain from the bin floor to the center sump. The flighting is mounted within a backboard which is held upright by front and rear wheel sub-assemblies. This sweep apparatus is revolved around the bin floor by a hydraulic track drive moving along an angle drive track, while the front and rear wheels ride on wheel tracks (not shown in figures above) when passing over the aeration floor.

The sweep uses an electric control system (not shown in figures above) outside the bin to power the electric motor enclosed within the center sump. This electric motor drives the lower gearbox, which drives the upper gearbox, which rotates on a swivel plate and drives the flighting through the universal joint as the sweep revolves around the bin.

The track drive hydraulic motor is powered through a hydraulic hose circuit routed from the hydraulic power supply in a galvanized, vented housing outside the bin door. The hydraulic power supply consists of an electric motor driving a hydraulic pump inside a hydraulic oil tank. The sweep's direction and speed is controlled by a proportional directional flow control valve using the control panel.

The sweep extender is adjusted in or out to maximize the amount of grain picked up by the end of the sweep nearest the bin wall.

Compatibility

- Intended Floor Types — This Commercial Bin Sweep is intended to be used with:
 1. aeration floor with one of the following patterns: double-H, 4-F, 4-parallel, 6-parallel, or other similar patterns, OR
 2. full concrete floor (no under-floor aeration).

Important

It is **not** intended to be used together with a full-floor aeration system.

- Bin Height — The recommended maximum bin height for use of this Commercial Bin Sweep is an overall height (to peak) of 120' (36.6 m). If your proposed bin height is higher than 120' (36.6 m), contact AGI for approval.

4. Pre-Assembly



Before continuing, ensure you have completely read and understood this manual's Safety section, in addition to the safety information in the section(s) below.

4.1. Check Shipment

Unload the bin sweep parts at the assembly site and compare the packing slip to the shipment. Ensure that all items have arrived and that none are damaged.

Report missing or damaged parts immediately to ensure that proper credit is received from AGI or your representative, and to ensure that any missing parts can be shipped quickly to avoid holding up the assembly process.

Important

Do not assemble or install damaged components.

4.2. Before You Begin

Before you assemble the bin sweep:

- Familiarize yourself with all the sub-assemblies, components, and hardware that make up the equipment.
- Have all parts and components on hand, and arrange them for easy access.
- Separate the hardware (bolts, nuts, etc.) and lay them out into groups for easier identification during assembly.

4.3. Required Materials

The materials below are not supplied and must be purchased separately. Contact your local dealer for assistance, if required.

Hydraulic Fluid

Use food-grade ISO 32 synthetic hydraulic oil.

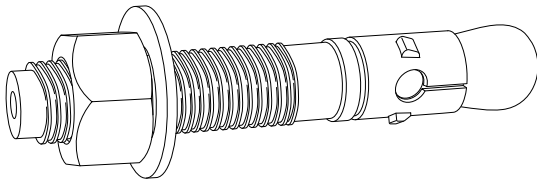
Table 3. Hydraulic Oil Quantity Required to be Available for Installation

Commercial Sweep Model	Quantity
BU-16-48BU-16-48EX	7 US liquid gallons(26 L)
BU-16-54BU-16-54EX	
BU-16-60BU-16-60EX	
BU-16-66BU-16-66EX	
BU-16-72BU-16-72EX	
BU-16-75BU-16-75EX	
BU-16-90BU-16-90EX	12 US liquid gallons(45 L)
BU-16-105BU-16-105EX	

Hardware

- Hardware to anchor the hydraulic power supply to the outside of the bin.
- If the optional kit of wheel track arcs has not been purchased from AGI for your sweep model, then wheel track arcs for each radius must be cut from minimum $\frac{1}{4}$ " (6 mm) galvanized steel plate to a minimum of 4" (102 mm) width. Some bins may require thicker plate if the aeration floor is not level with the concrete floor.
- $\frac{1}{2}$ " x 5" Concrete Anchors (similar to that shown in [Figure 5](#)) – sufficient quantity for all wheel tracks and angle drive track in installation procedure.

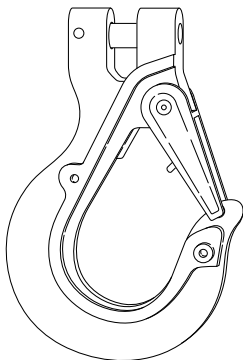
Figure 5. Concrete Anchor Type for Wheel Tracks and Angle Drive Track



4.4. Required Lifting Equipment

Use proper lifting equipment, including 4 chain hooks (with safety latches) as shown in [Figure 6](#), together rated to lift the 2600 lb (1179 kg) center sump (max weight).

Figure 6. Chain Hook (with Safety Latch)

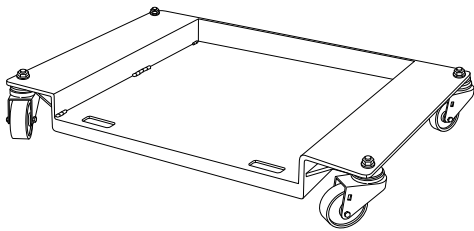


4.5. Required Tools

The following tools and equipment are required:

- welder
- reciprocating saw
- cutting torch
- angle grinder
- several grinding discs
- impact wrench (with full set of SAE sockets)
- full set of SAE hand wrenches
- 30' (10 m) tape measure
- 100' (30 m) tape measure (for marking/scribing wheel tracks and angle drive tracks)
- box of chalk or several paint markers
- work lights
- variety of wood blocks
- various hand tools
- 5' (1.5 m) pry bars
- one floor jack
- two floor dollies (similar to that shown in [Figure 7](#))

Figure 7. Floor Dolly



5. Assembly



Before continuing, ensure you have completely read and understood this manual's Safety section, in addition to the safety information in the section(s) below.

5.1. Assembly Safety

WARNING

- All electrical connections shall be made by a qualified electrician and must meet the applicable local codes and regulations.
- Do not take chances with safety. The components can be large, heavy, and hard to handle. Always use the proper tools, rated lifting equipment, and lifting points for the job.
- Carry out assembly in a large open area with a level surface.
- Always have two or more people assembling the bin sweep.
- Make sure you have sufficient lighting for the work area.
- Tighten all fasteners according to their specifications. Do not replace or substitute bolts, nuts, or other hardware that is of lesser quality than the hardware supplied by the manufacturer.

5.2. Overview of Assembly and Installation

Order of assembly and installation:

1. [Section 5.3 – Build the Center Sump Concrete Form on page 20](#)
2. [Section 5.4 – Install the Center Sump into the Formed Opening on page 23](#)
3. [Section 5.5 – Assemble the Sweep Sections on page 25](#)
- 4.
5. [Section 5.8 – Install the Wheel Track Arcs on page 39](#)
6. [Section 5.9 – Adjust the Alignment of the Front and Rear Wheels on page 39](#)
7. [Section 5.10 – Install the Angle Drive Track on page 41](#)
- 8.
- 9.
- 10.

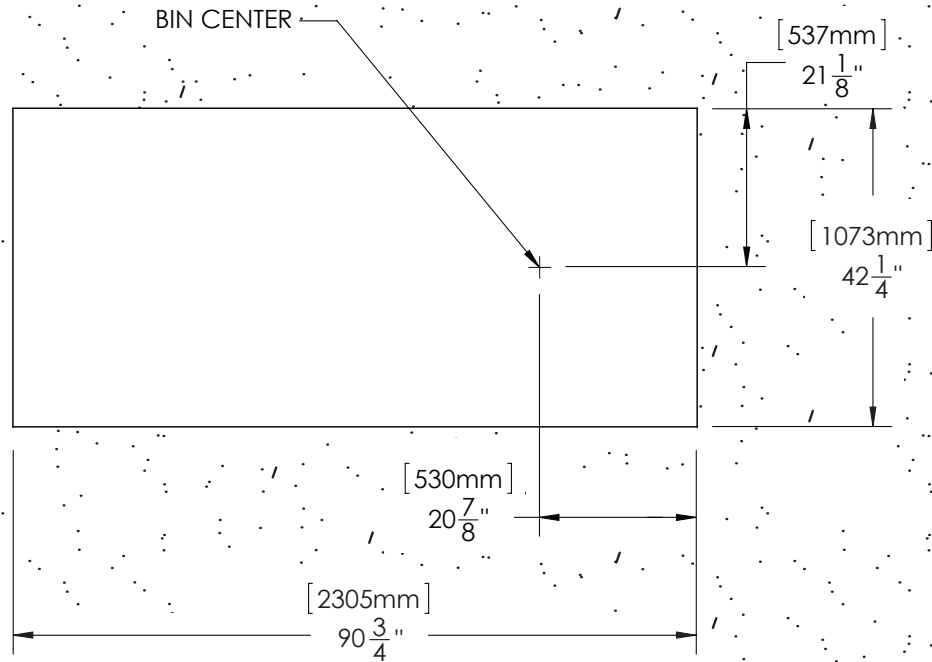
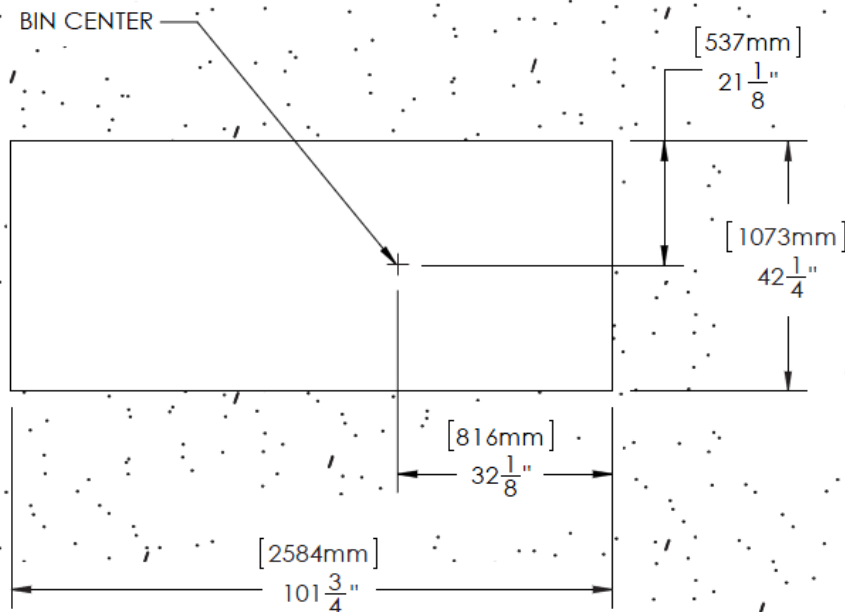
5.3. Build the Center Sump Concrete Form

1. Find and verify the centerpoint of the bin. Use a tape measure to check several points along the circumference to the center (radius). Refer also to the bin site layout drawing.

Important

The bin's center must be found accurately to ensure that the sweep does not contact the bin wall.

2. Make measurements for the dimensions of the opening (for the center sump) to be formed in the concrete floor using the bin site layout drawing and either [Figure 8](#) or [Figure 9](#) for your respective center sump size.

Figure 8. Formed Opening in Concrete Floor for Standard Center Sump**Figure 9. Formed Opening in Concrete Floor for Extended (EX) Center Sump**

- Build the concrete form for the measured opening. Pour concrete according to all foundation specifications. After the concrete has dried for the proper amount of time, remove the concrete form.

4. Install the center sump cap frame (tight fit; to remain in place permanently). Make sure that the distance is no more than 1" (25 mm) from the originally-situated centerpoint of the bin to the centerpoint of the cap frame shown for your respective center sump size in either [Figure 10](#) or [Figure 11](#).

Note

The cap frame can also be installed **prior** to pouring concrete, in conjunction with the concrete form, if desired.

Figure 10. Cap Frame Installation for Standard Center Sump

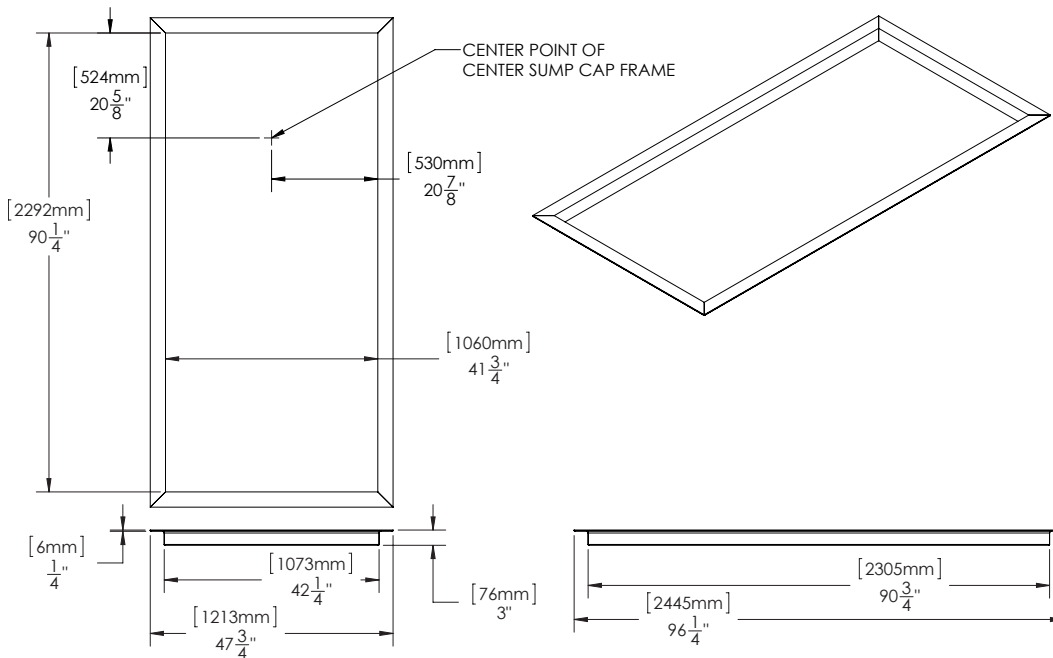
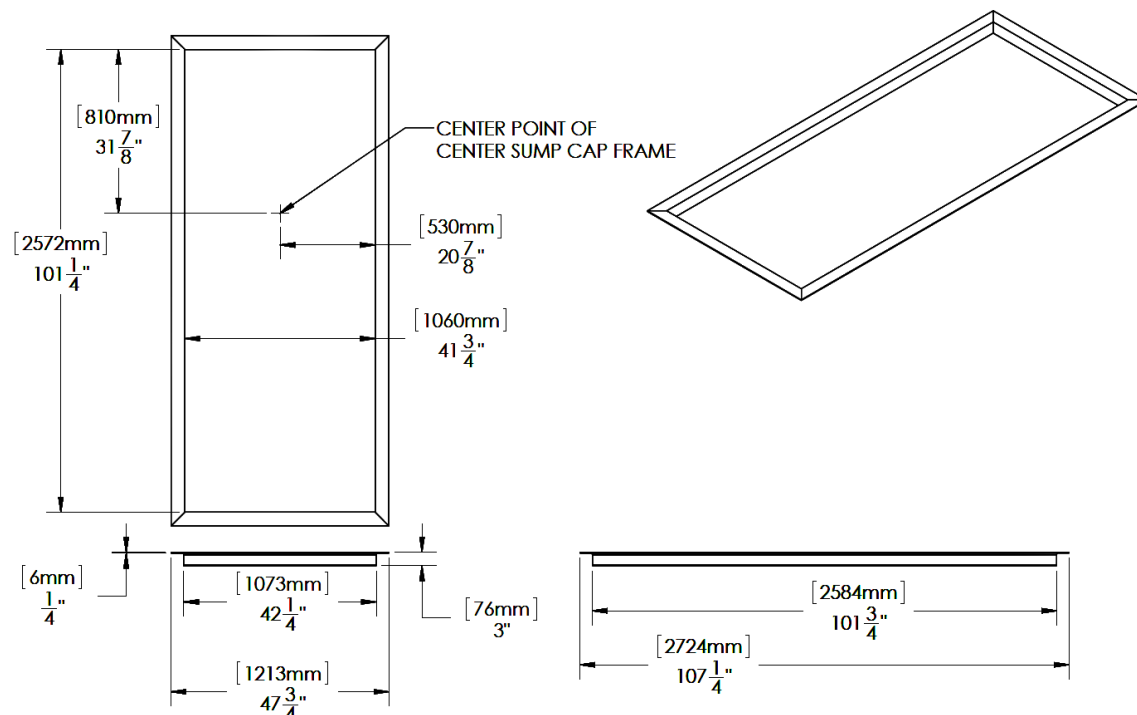


Figure 11. Cap Frame Installation for Extended (EX) Center Sump

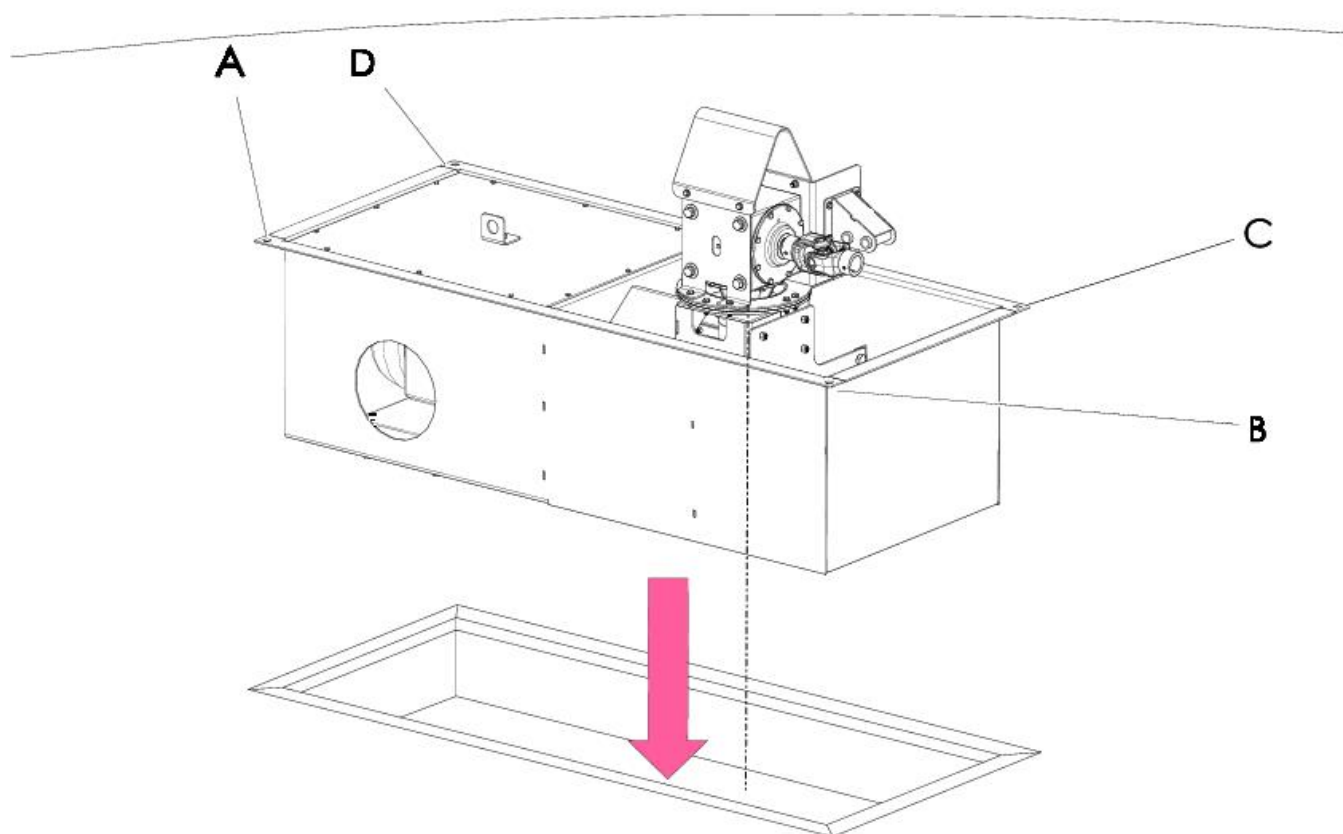


5.4. Install the Center Sump into the Formed Opening

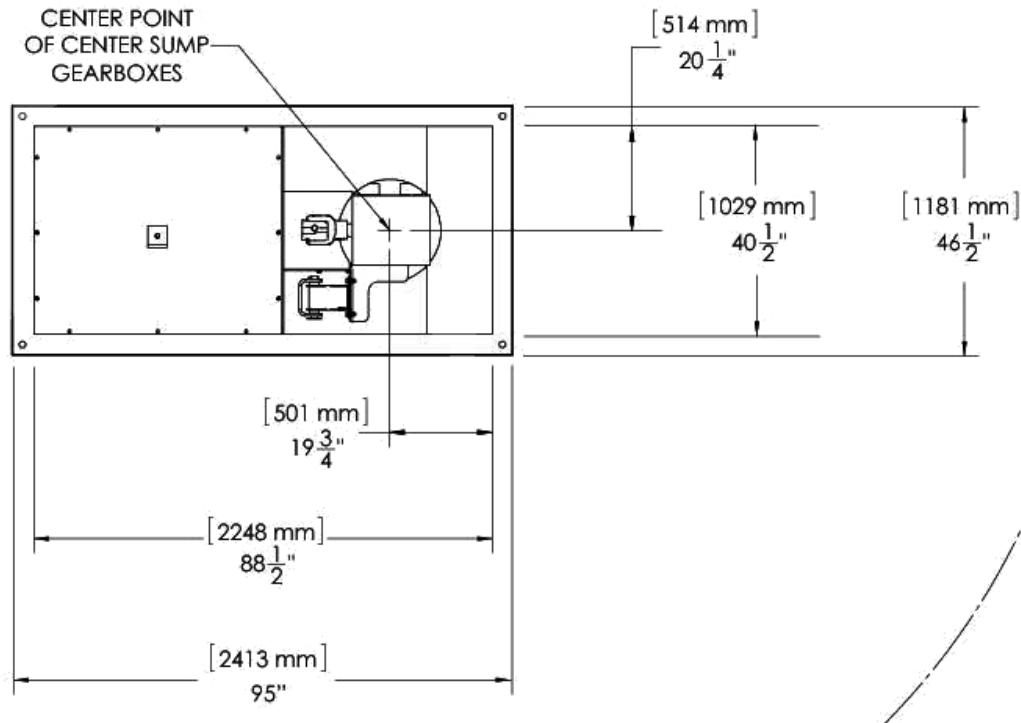
1. Lift the center sump by the 4 corner holes using 4 properly rated chain hooks and lower the center sump into its formed opening in the concrete floor as shown in [Figure 12](#). Ensure the motor end is on the correct side.

⚠ WARNING Lift the center sump by only the specified lifting points shown in 12 Lower Center Sump into Concrete Opening, page 23. Do NOT lift by the clevis on the motor enclosure lid.

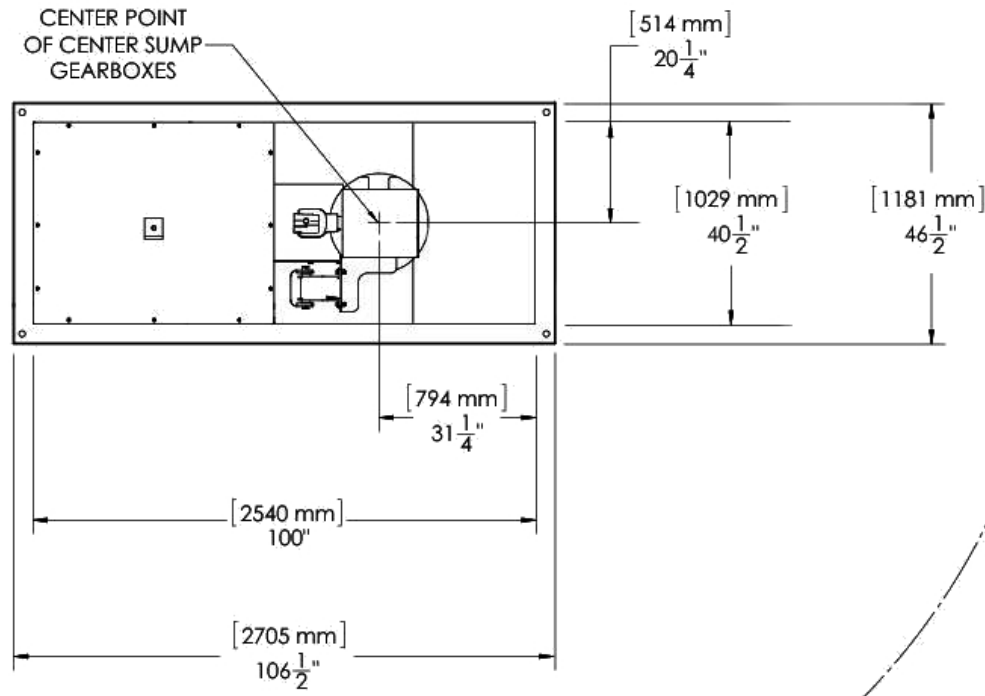
Figure 12. Lower Center Sump into Concrete Opening



2. Make sure that the centerpoint of the center sump gearboxes shown for your respective center sump size in either [Figure 13](#) or [Figure 14](#) coincides with the cap frame centerpoint. All center sump flange lip edges should also be centered between all cap frame flange lip edges.

Figure 13. Standard Center Sump**Note**

In Figure 13, the dimensions of 19-3/4" (501 mm), 20-1/4" (514 mm), 40-1/2" (1029 mm), and 88-1/2" (2248 mm) are measured to the outside of the center sump walls.

Figure 14. Extended (EX) Center Sump

Note

In [Figure 14](#), the dimensions of 20-1/4" (514 mm), 31-1/4" (794 mm), 40-1/2" (1029 mm), and 100" (2540 mm) are measured to the outside of the center sump walls.

3. Double-check that there will be no interference of the sweep with the bin wall by performing the following:
 - a. Measure from the outer edge of the upper gearbox's rotation swivel plate to where the sweep's endpoint will be (far end of outermost backboard section).
 Example (see): $17\text{-}1/2'' - 9\text{-}13/16'' + 115\text{-}3/4'' + 144'' + 72\text{-}1/8'' = 339\text{-}9/16''$, or equivalently $444\text{ mm} - 249\text{ mm} + 2940\text{ mm} + 3658\text{ mm} + 1832\text{ mm} = 8625\text{ mm}$.
 - b. Ensure there is a gap between 2" – 8" (51 mm – 203 mm) between the sweep's endpoint and the bin wall around the bin's whole circumference. Ensure this gap tolerance is also met for the bin's inner wall parts (bolts, supports, doors, etc.).
4. After verifying from the steps above that the center sump is in the proper final position, it is recommended to perform one of the following two methods to anchor it in place:
 - a. Weld portions of the center sump flange lip edges to the cap frame flange lip edges.
 - b. Place wedges or shims in the gaps between the center sump walls and the cap frame vertical metal / concrete opening wall.
5. Install the electric motor.
6. With the motor enclosure lid fastened, remove the clevis on top of the lid and place it in a location for safekeeping for future maintenance. Re-fasten the 3/4" bolt from the clevis in the open bolt hole in the lid.

5.5. Assemble the Sweep Sections

Important

During assembly and installation, never place the sweep sub-assemblies or center sump on the aeration floor, or else damage to the floor will result. Always place these heavy objects on the concrete floor during assembly and installation.

1. Start assembly with the 115-3/4" (2940 mm) innermost backboard section (closest to center pivot) as shown in your particular sweep model figure in .

**WARNING**

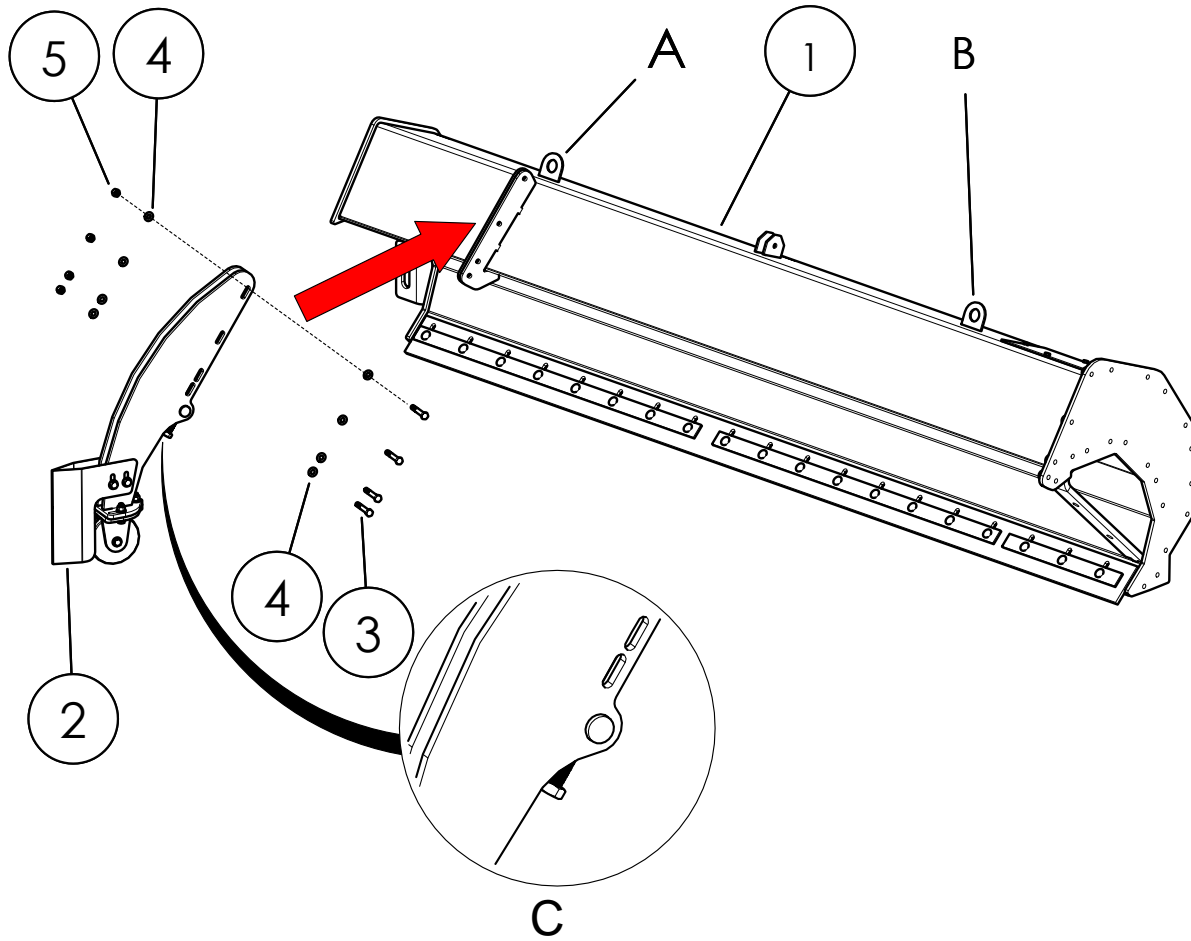
Backboards are very heavy and unstable until the front and rear wheel sub-assemblies are attached.

Lift by only the specified lifting points, noted as A and B in 15 Attach Front Wheel, page 26.

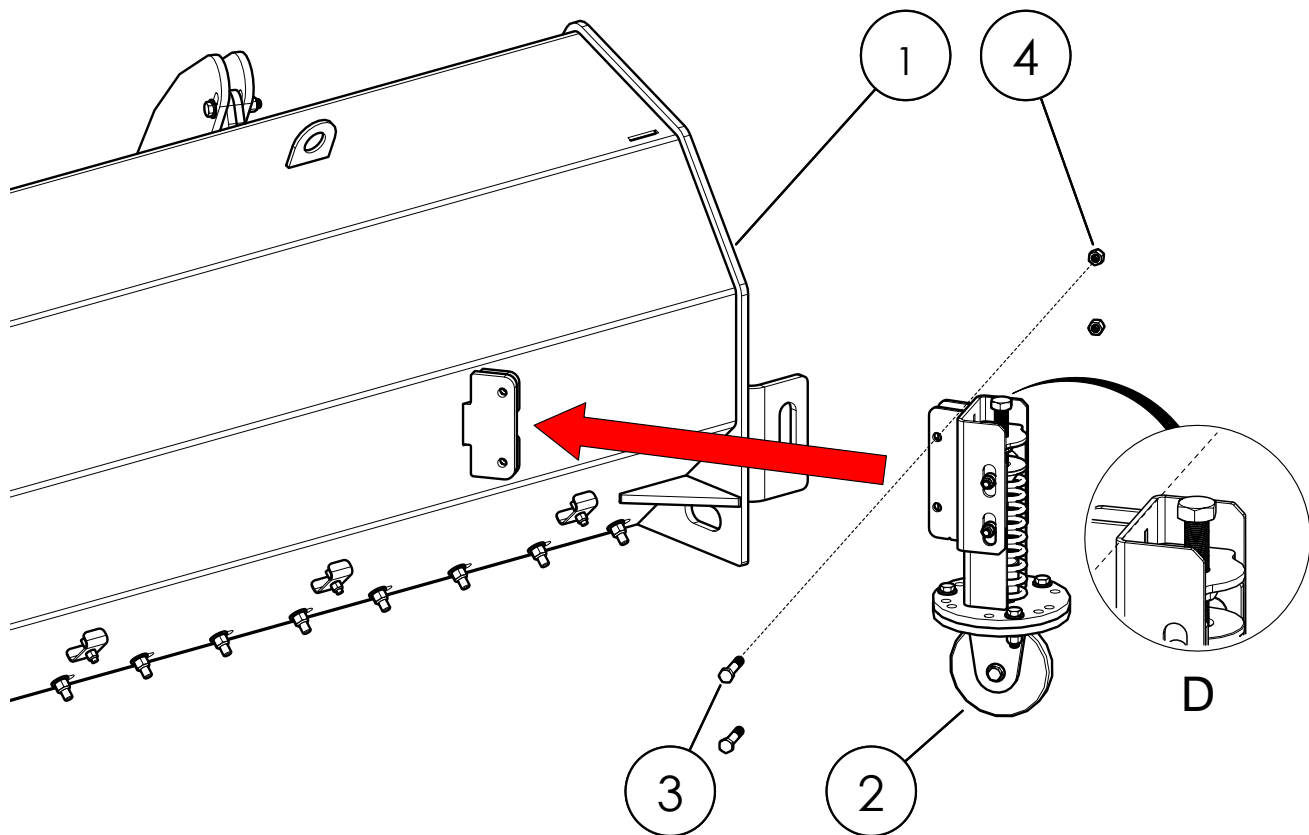
- a. Attach the front wheel sub-assembly and angled rear wheel sub-assembly (see [Figure 15](#) / [Table 4](#) and [Figure 16](#) / [Table 5](#)).

Note

There is **only one angled** rear wheel sub-assembly and it must be installed on the innermost backboard section. All the remaining rear wheel sub-assemblies to be installed are not angled.

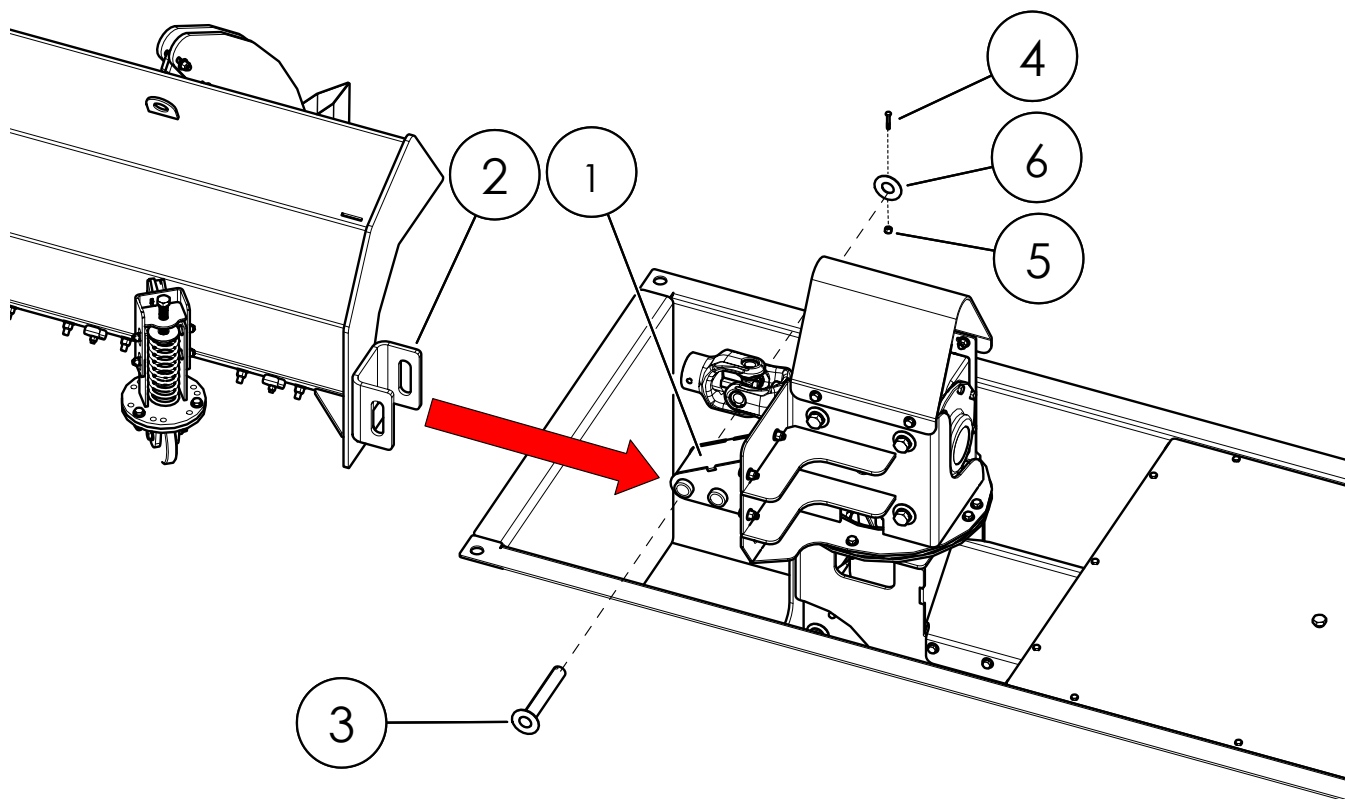
Figure 15. Attach Front Wheel**Table 4. Attach Front Wheel**

Item Number	Part Number	Description	Quantity
1	BU-0500266	10' INNER BACKBOARD SECTION ASSEMBLY	1
2	BU-0500354	SLOTTED FRONT WHEEL ASSEMBLY	1
3	33091	HEX BOLT 1/2-13 X 3"	4
4	33025	FLAT WASHER 1/2" ZP	8
5	33138	NYLON LOCK NUT 1/2-13	4

Figure 16. Attach Angled Rear Wheel**Table 5. Attach Angled Rear Wheel**

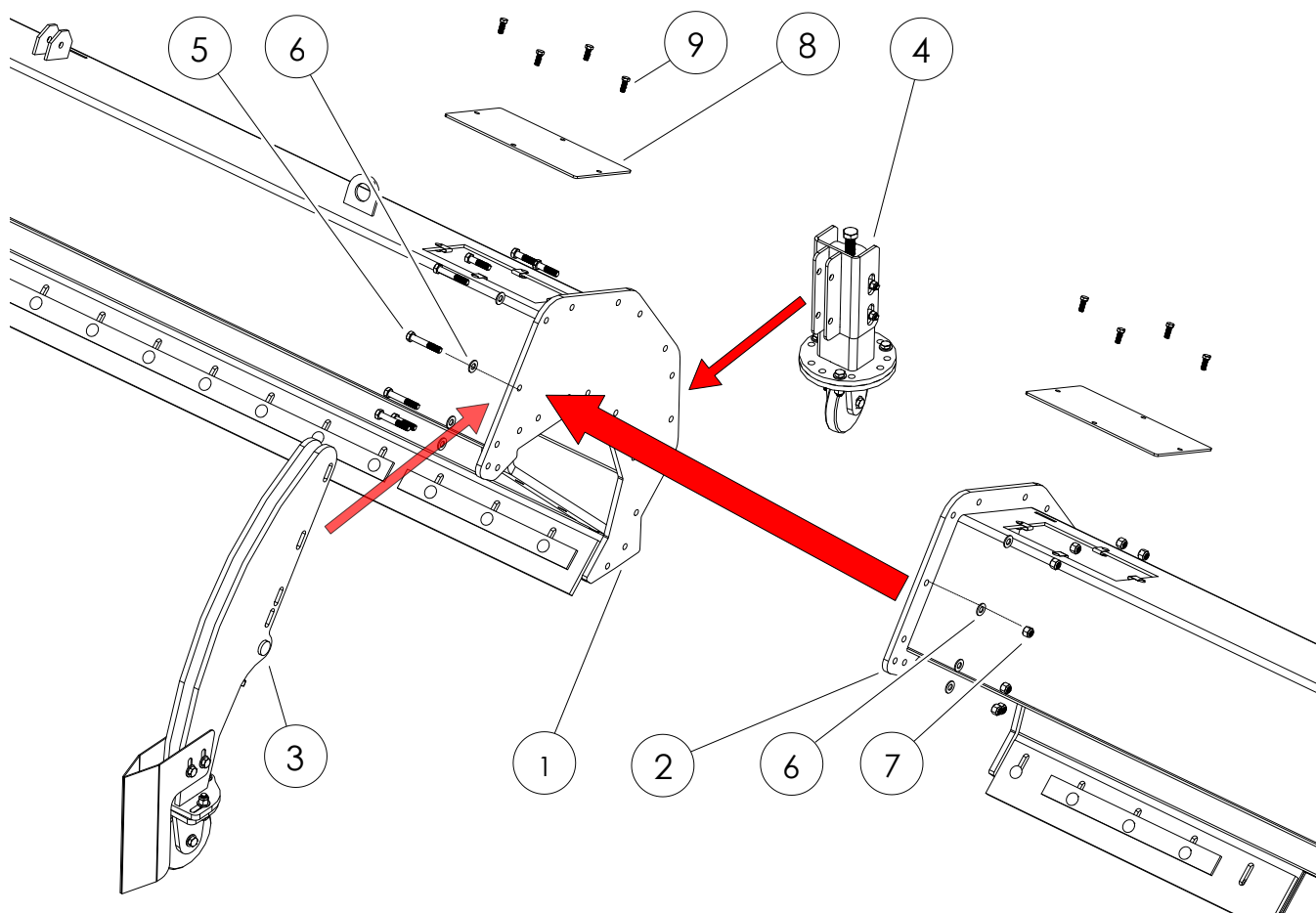
Item Number	Part Number	Description	Quantity
1	BU-0500266	10' INNER BACKBOARD SECTION ASSEMBLY	1
2	1051721	REAR SPRING WHEEL ASSEMBLY, ANGLED	1
3	1002229	HEX BOLT 1/2-13 X 2.5" ZP	2
4	33138	NYLON LOCK NUT 1/2-13 ZP	2

- b. Slide the backboard mount bracket into the rotation support apparatus and secure it with the hinge pin (see [Figure 17](#) and [Table 6](#)). Adjust the front wheel sub-assembly height (use adjustment bolt in detail view C of [Figure 15](#)) and the rear wheel sub-assembly height (use adjustment bolt in detail view D of [Figure 16](#)) so that the pin is in the center of the slot in the mount bracket.

Figure 17. Pin Backboard Swivel**Table 6. Pin Backboard Swivel**

Item Number	Part Number	Description	Quantity
1		ROTATION SUPPORT APPARATUS	
2		SWEEP MOUNT BRACKET ON 10' INNER BACKBOARD SECTION ASSEMBLY	
3	BU-0500424	SWEEP CENTER HINGE PIN	1
4	33272	HEX BOLT 1/4-20 X 1-3/4" ZP	1
5	4003	NYLON LOCK NUT 1/4-20 ZP	1
6	BU-0500425	CENTER HINGE SHAFT WASHER GALV	1

2. Connect the next backboard closest to the center pivot as shown in your particular sweep model figure in , along with front and rear wheel sub-assemblies (see [Figure 18](#) and [Table 7](#)).

Figure 18. Connect First Two Backboards**Table 7. Connect First Two Backboards**

Item Number	Part Number	Description	Quantity
1	BU-0500266	10' INNER BACKBOARD SECTION ASSEMBLY	1
2	depends on model (see)	12' BACKBOARD SECTION ASSEMBLY	1
3	BU-0500354	SLOTTED FRONT WHEEL ASSEMBLY	1
4	1051720	REAR SPRING WHEEL ASSEMBLY	1
5	33091	HEX BOLT 1/2-13 X 3"	22
6	33025	FLAT WASHER 1/2" ZP	8
7	33138	NYLON LOCK NUT 1/2-13	22
8		BACKBOARD SHELL COVER PLATE	already included on back- boards
9		HEX BOLT 3/8-16 X 1" GRADE5 ZP	

3. Connect the remaining backboard sections (including front and rear wheel sub-assemblies) in the correct order from inner to outer for your particular sweep model figure as shown in .

Important

In your particular model figure in , make sure the backboard which contains a cutout at the bottom of it is connected in the correct order to be able to clear the angle drive track.

4. Install all the bearings (see [Figure 19](#) and [Table 8](#)). Leave loose until all flightings are in final positions.

Figure 19. Install Bearings

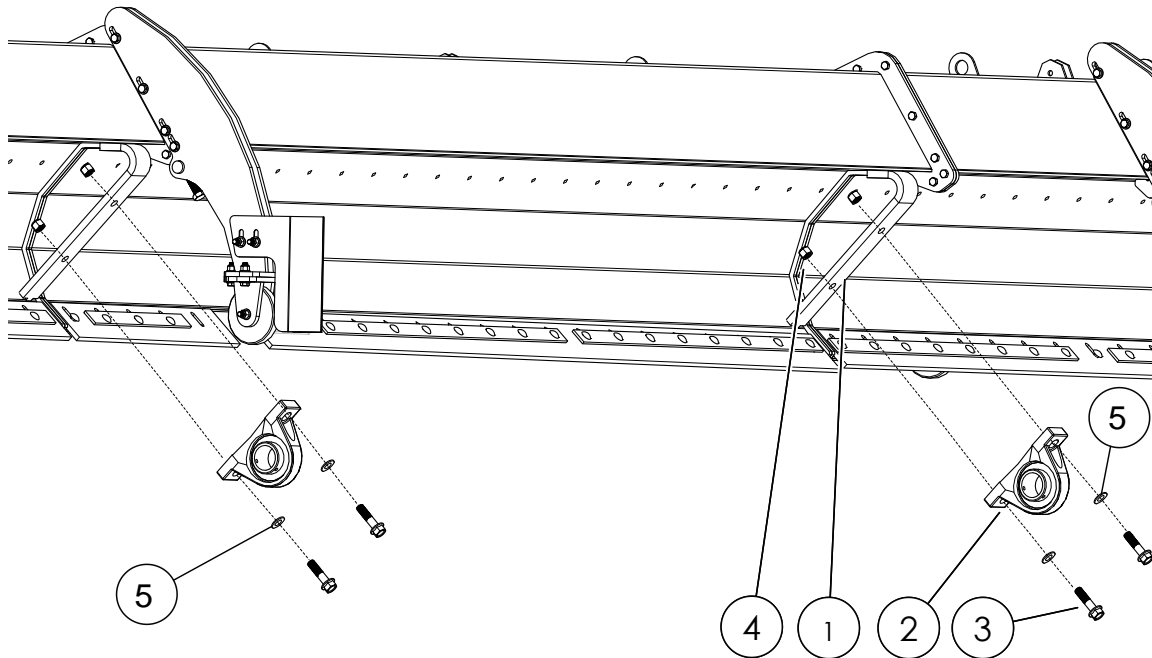
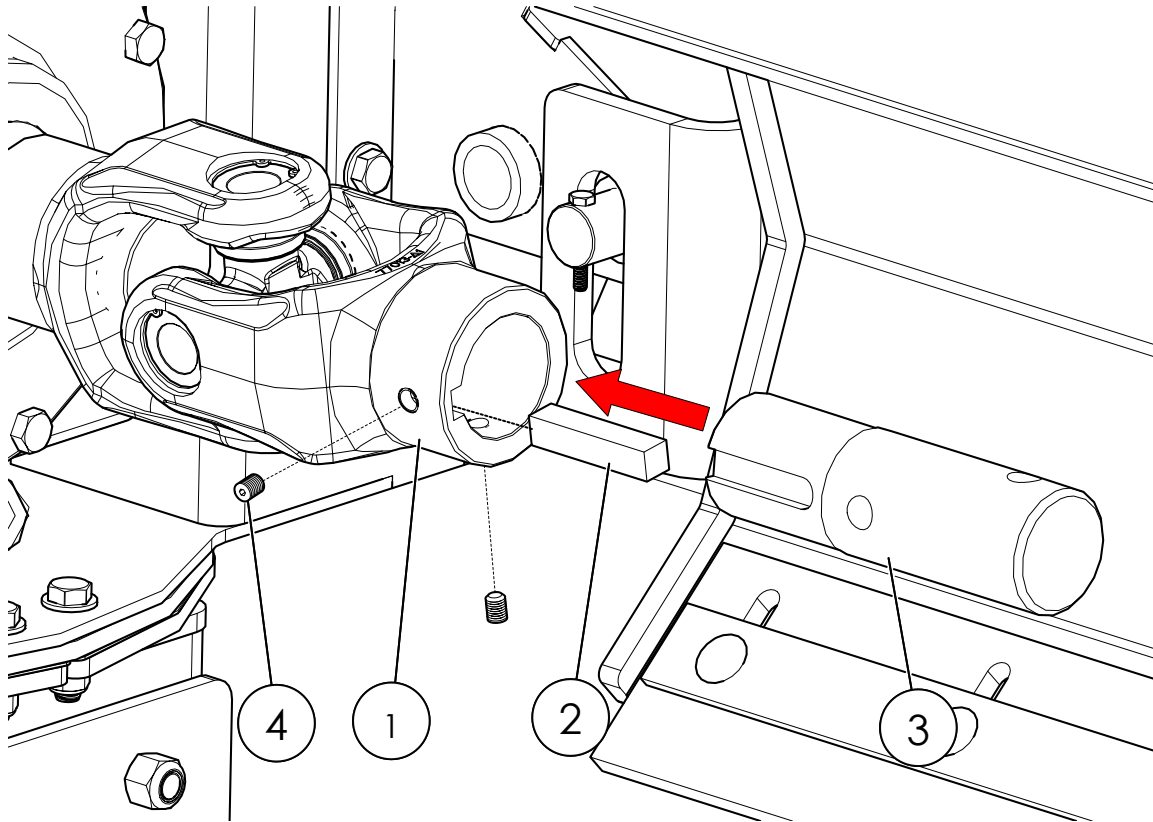


Table 8. Install Bearings

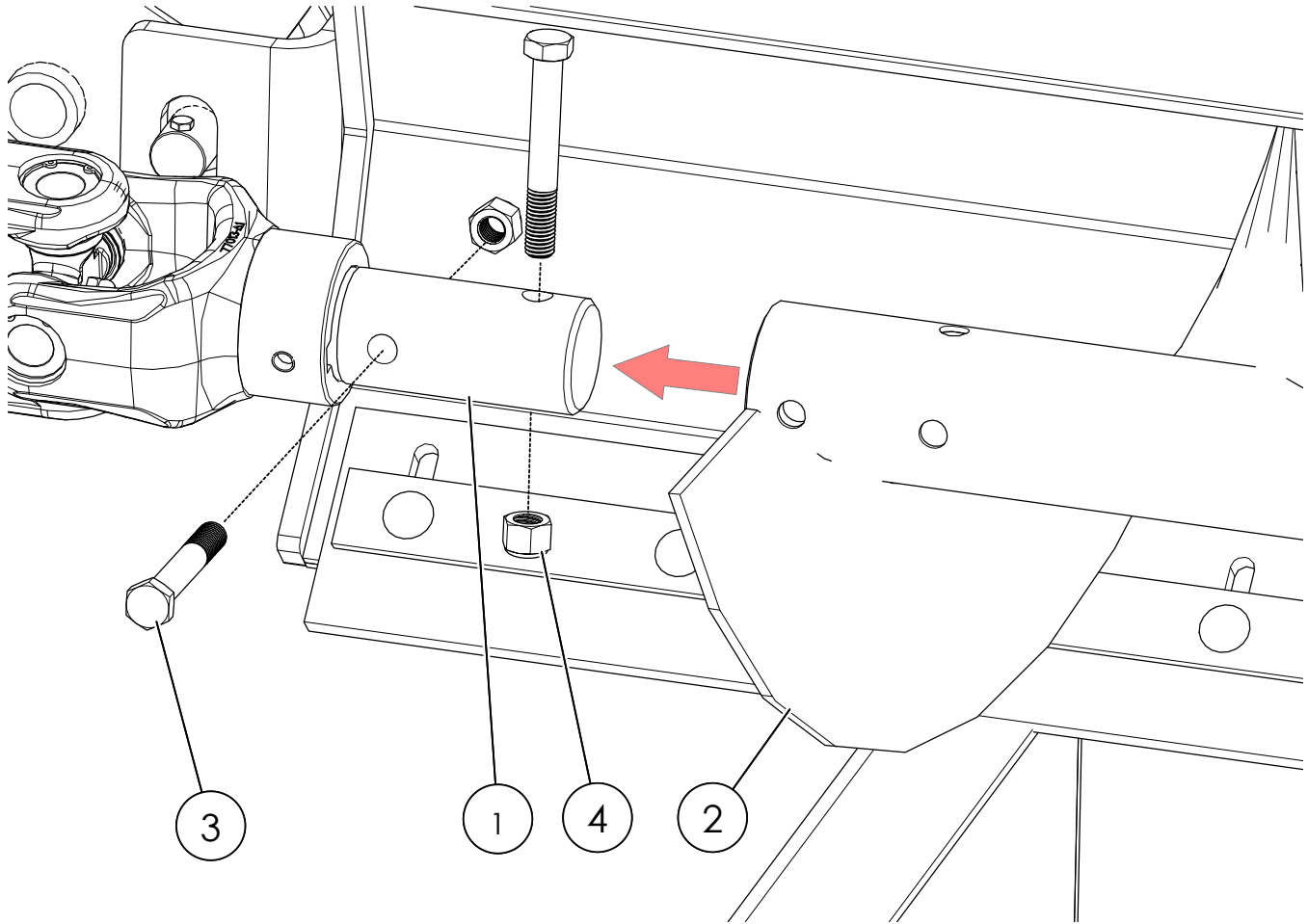
Item Number	Part Number	Description	Quantity
1		PILLOW BLOCK BEARING MOUNT ARM	already included on back- boards
2	BU-0500140	BEARING, PILLOW BLOCK 2.5" SHAFT	1 per backboard section
3	33132	FLANGE HEX BOLT 3/4-10 X 3"	2 per bearing
4	33140	NYLOCK NUT , 3/4-10	
5	33027	FLAT WASHER, 3/4"	

5. Insert the yoke flight drive shaft (see [Figure 20](#) and [Table 9](#)).

Figure 20. Insert Flight Drive Shaft**Table 9. Insert Flight Drive Shaft**

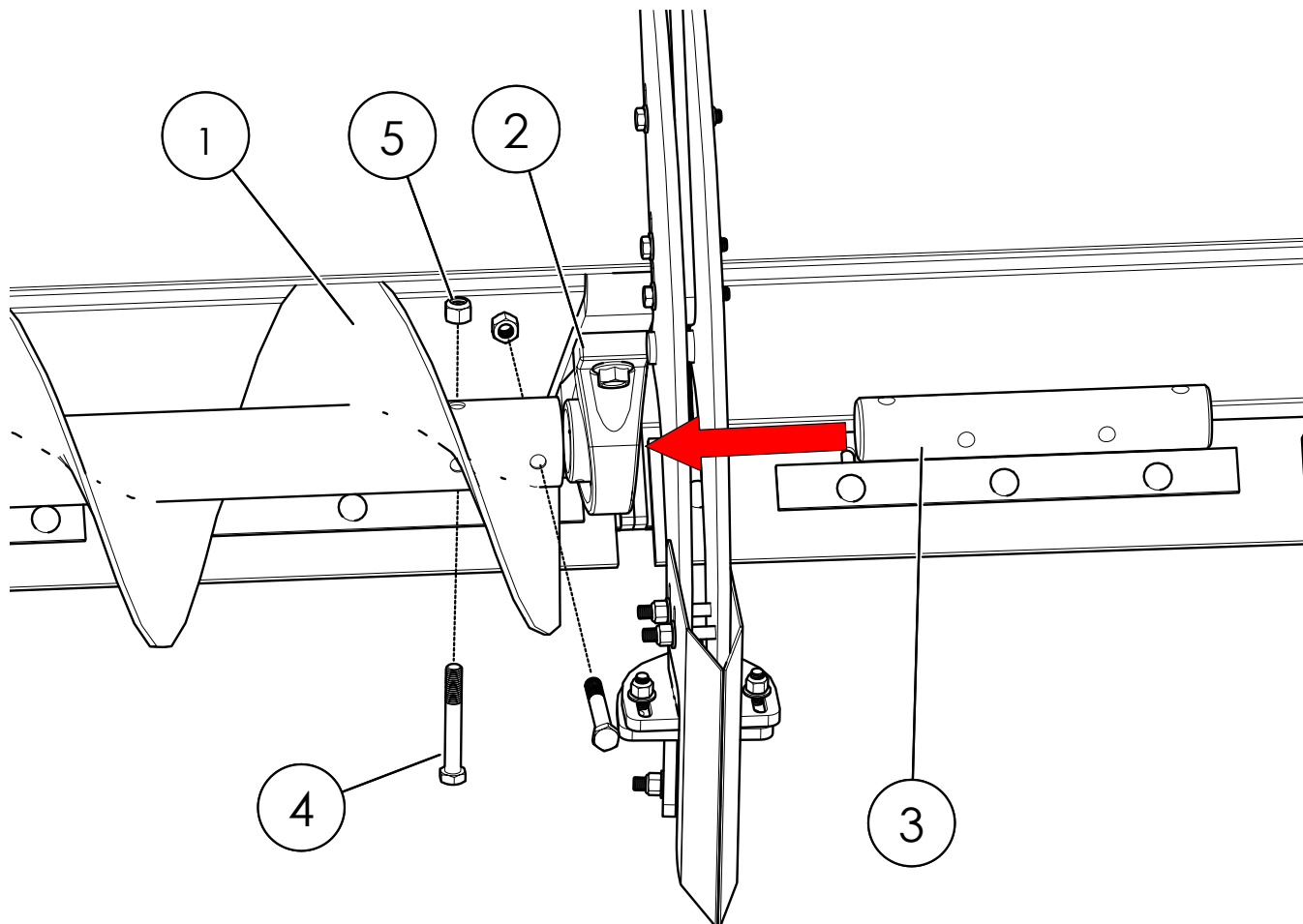
Item Number	Part Number	Description	Quantity
1		77E UNIVERSAL-JOINT BLK, 2-7/16 X 2-7/16	already attached to upper gearbox shaft
2	1027214	SQUARE KEY 5/8 X 3"	1
3	1051492	YOKE FLIGHT DRIVE SHAFT	1
4	1031395	SET SCREW, 1/2-13 X 1/2" CUP POINT	2

6. Attach the flighting onto the yoke flight drive shaft (see [Figure 21](#) and [Table 10](#)).

Figure 21. Attach Flighting onto Drive Shaft**Table 10. Attach Flighting onto Drive Shaft**

Item Number	Part Number	Description	Quantity
1	1051492	YOKE FLIGHT DRIVE SHAFT	1
2	1051497	FLIGHTING 15" X 108.75"	1
3	1002236	HEX BOLT 5/8-11 X 4-1/2	2
4	33139	NYLON LOCK NUT 5/8-11 ZP	2

7. Slide the flight union through the bearing and into the other end of the flighting (see [Figure 22](#) and [Table 11](#)).

Figure 22. Fasten Flight Union into First Flighting**Table 11. Fasten Flight Union into First Flighting**

Item Number	Part Number	Description	Quantity
1	1051497	FLIGHTING 15" X 108.75"	1
2		BEARING, PILLOW BLOCK 2.5" SHAFT	
3	1051491	FLIGHT UNION 2.5"	1
4	1002236	HEX BOLT 5/8-11 X 4-1/2	2
5	33139	NYLON LOCK NUT 5/8-11 ZP	2

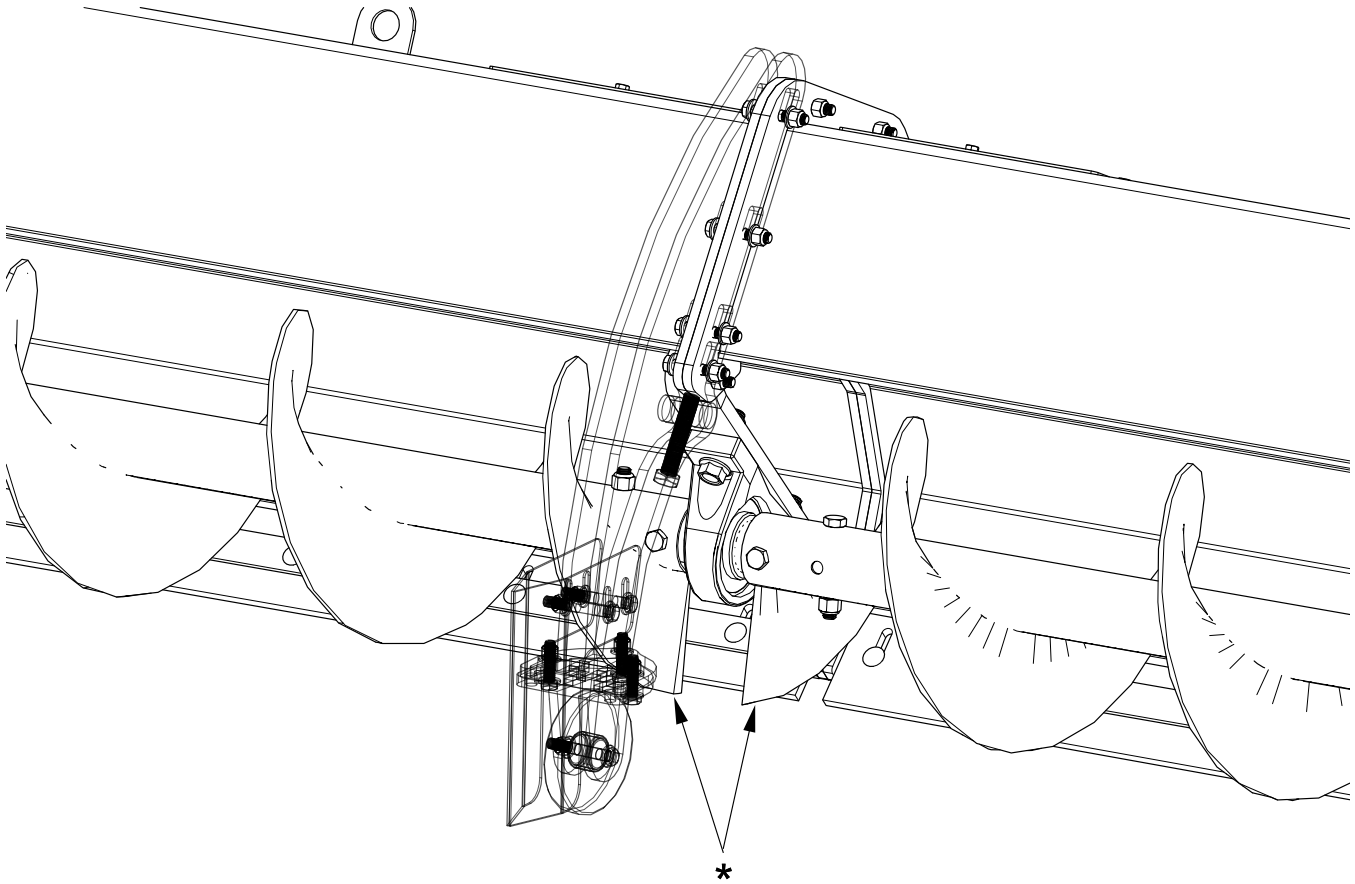
8. Attach the remaining flighting sections in the same order as the backboards as in [Step 3 on page 29](#).

Note

Work to keep the center of each flighting section between each bearing. The end edges of the flighting should have 3/8" – 1/2" (10 mm – 13 mm) clearance to the bearing mount arm; if not, trim the end edge back with a reciprocating saw or torch.

Important

- Make sure that each subsequent flighting section attached is bolted onto the flight union so that the flighting sections on each side of the union are synchronized (the helical pattern continues across the bolted connection as shown in [Figure 23](#) by the asterisk (*)). If the connection is bolted a half-rotation out of position, it will not result in proper/optimum grain flow performance during operation.
- Install the flighting section with a notch in the backboard with the cutout.
- Mount the flighting section at the end of the sweep on the flight end cap shaft.

Figure 23. Synchronized Flighting Sections

9. Tighten the bolts for the pillow block bearings to the mount arm on each backboard section.
10. Tighten the set screws on the bearings.

5.6. Install the Electric Motor

Install the electric motor as shown in [Figure 24](#) and [Table 12](#).

Figure 24. Electric Motor Installation

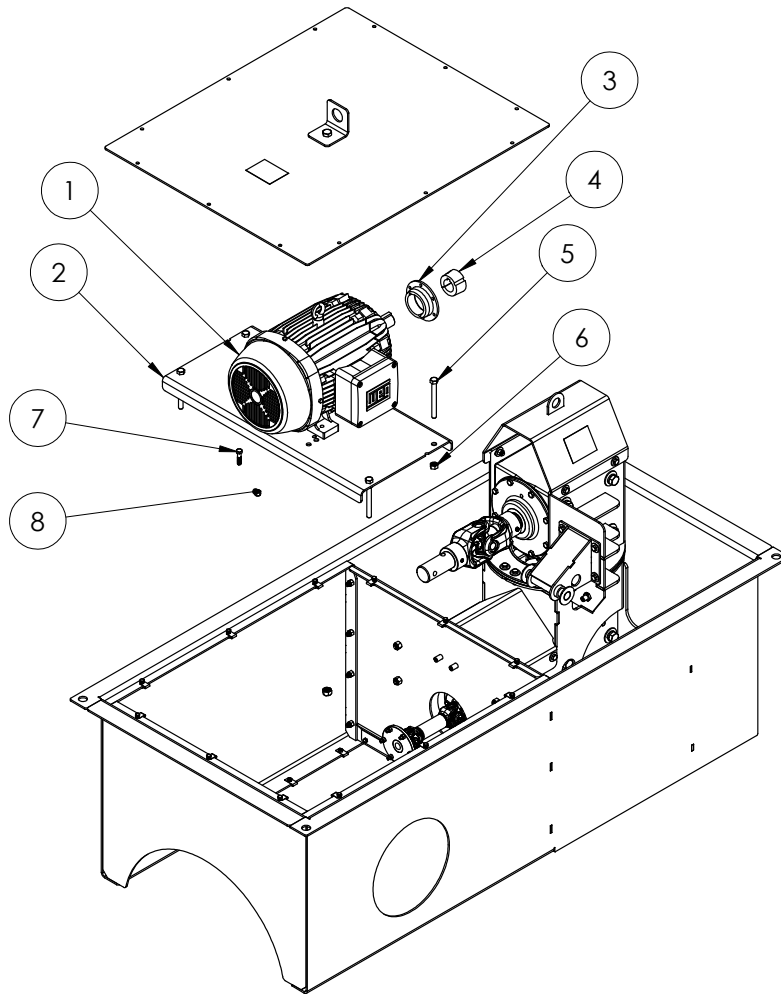


Table 12. Electric Motor Installation

Item Number	Part Number	Description	Quantity
1	Varies	Electric Motor	1
2	Varies	Motor Mount Plate	1
3	BU-0500158	Driveline Hub 226091	1
4	Varies	Shaft Adapter #2517 Bush	1
5	BU-0027249	Adjust Bolt 5/8"-11 X 6"	4
6	33139	Hex Nut 5/8"-11 ZP	4
7	Varies	Hex Bolt	
8	Varies	Lock Nut	

5.7. Install the Hydraulic Power Supply

1. Plumb two hydraulic hose lines from the center sump divider wall, underneath the bin floor, to the directional control valve (see [Figure 25](#), [Figure 26](#), and [Figure 27](#) and [Table 13](#) and [Table 14](#)).

Figure 25. Hydraulic Hose Routing Schematic

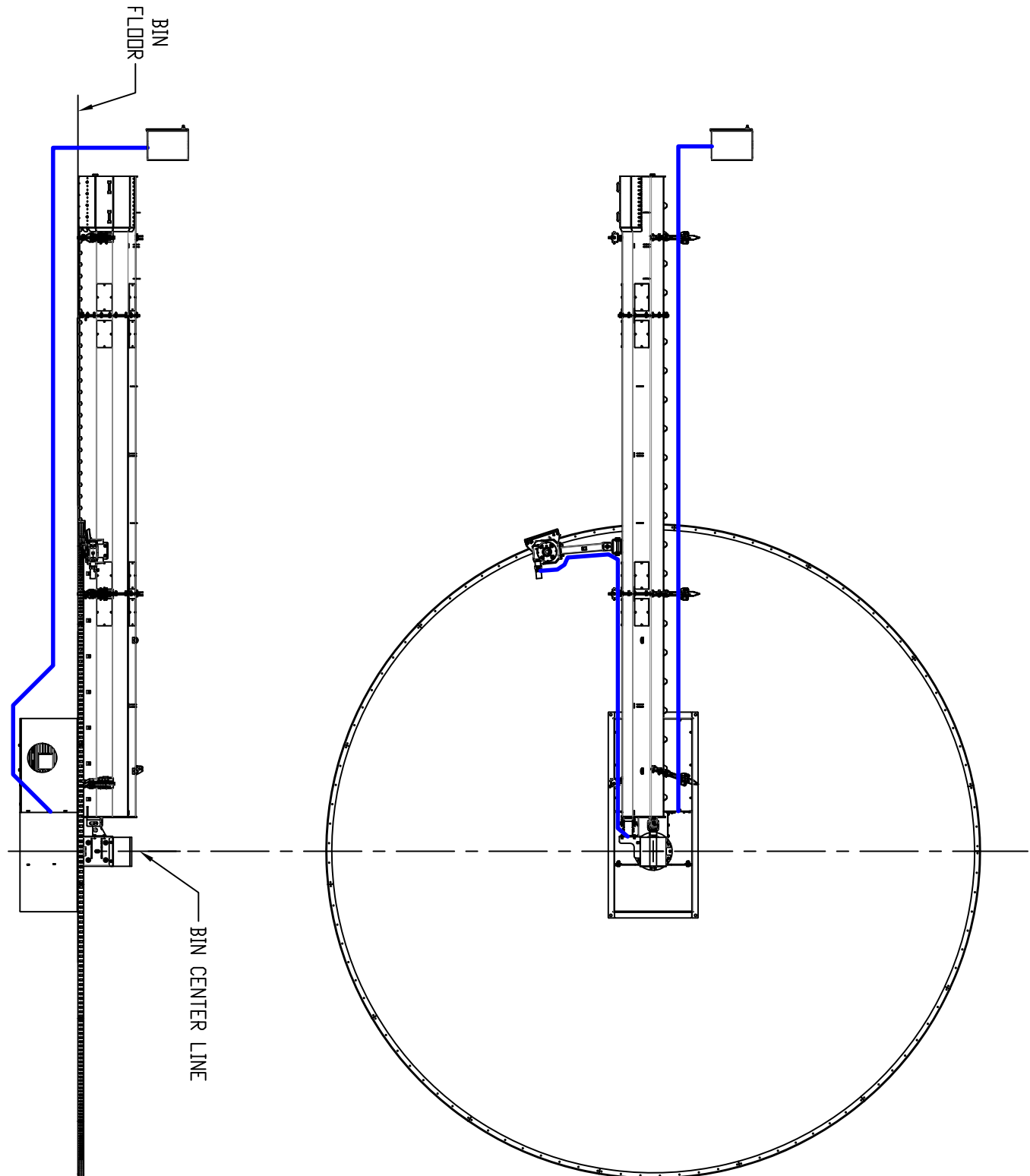


Table 13. Hydraulic Hose Lengths from Center Sump to Hydraulic Power Supply

Commercial Sweep Model	Length	Part Number	Quantity
BU-16-48 BU-16-48EX	30'(9144 mm)	BU-0500442	2
BU-16-54 BU-16-54EX	36'(10 973 mm)	BU-0500404	2
BU-16-60 BU-16-60EX	36'(10 973 mm)	BU-0500404	2
BU-16-66 BU-16-66EX	39'(11 887 mm)	BU-0500443	2
BU-16-72 BU-16-72EX	44'(13 411 mm)	BU-0500438	2
BU-16-75 BU-16-75EX	44'(13 411 mm)	BU-0500438	2
BU-16-90 BU-16-90EX	51'(15 545 mm)	BU-0500445	2
BU-16-105 BU-16-105EX	59'(17 983 mm)	BU-0500447	2

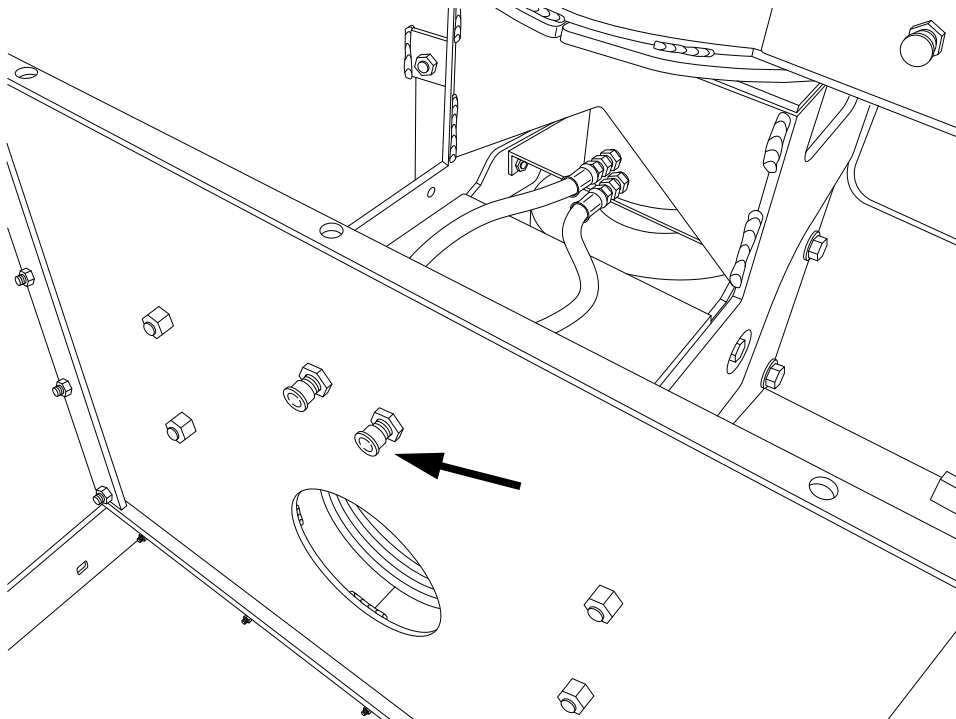
Figure 26. Hydraulic Hose Connections at Center Sump Divider Wall

Figure 27. Hydraulic Power Supply Installation

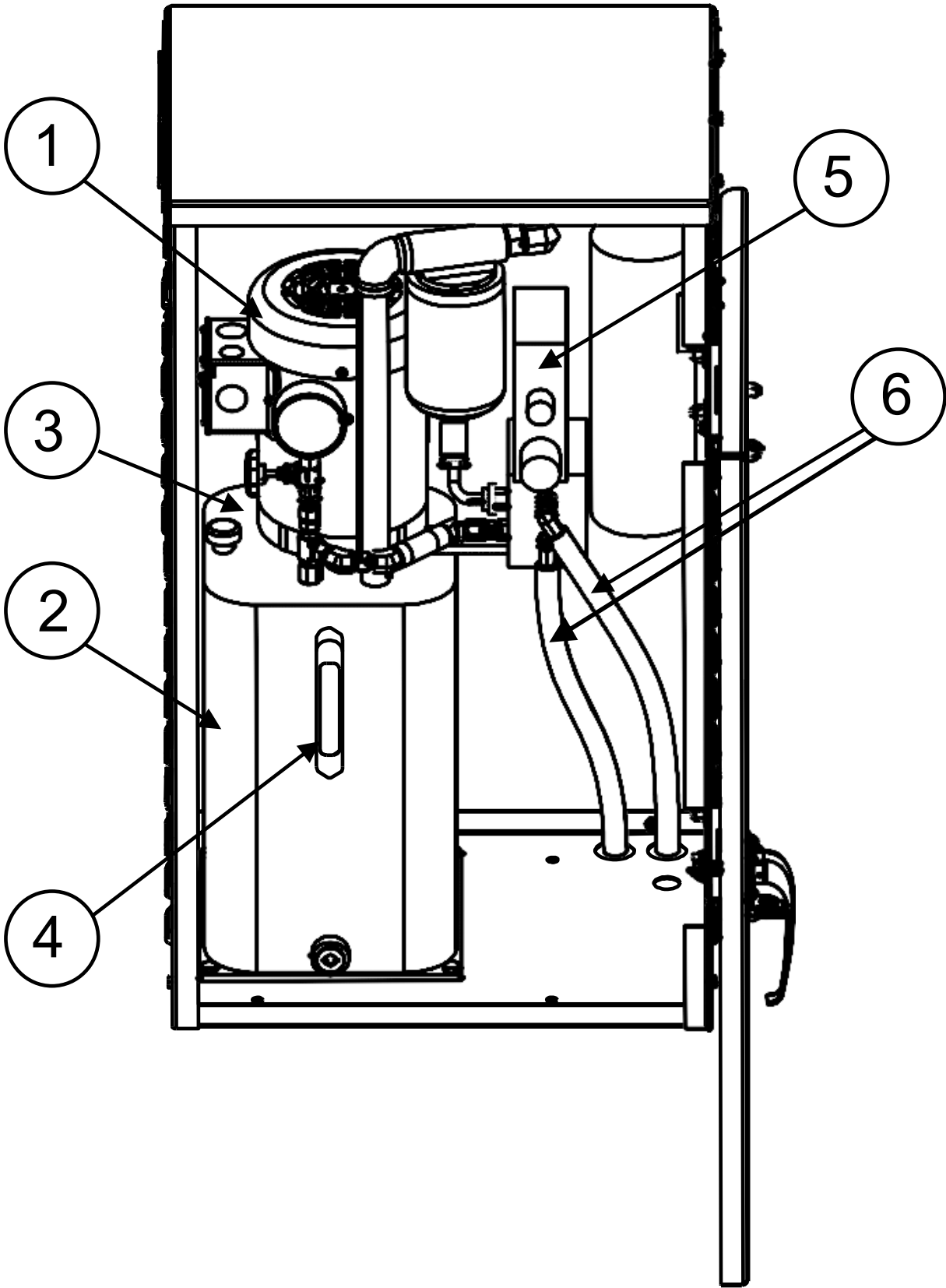


Table 14. Hydraulic Power Supply Installation

Item Number	Description
1	Electric Motor
2	Hydraulic Oil Tank (Hydraulic Pump inside)
3	Tank Cap
4	Sight Gauge
5	Proportional Directional Flow Control Valve
6	Hydraulic Hoses (3/8", 2500 psi) see Table 13

- Anchor (by method of installer's choice) the hydraulic power supply to the outside of the bin, the location of which is required to be immediately beside the bin door, where the operator can view the sweep.
- Install the electric motor. Make sure the motor's internal rotation direction matches the direction indicated on the fan shroud decal on the motor.
- Pour hydraulic oil into the tank/reservoir (see [Figure 27](#) and [Table 14](#)) up to the middle level in the sight gauge. See for the manufacturer's hydraulic oil specification. Do not overfill.

5.8. Install the Wheel Track Arcs

Note

Prior to the following, install the aeration floor.

- Mark/scribe the wheel paths (shown in your respective sweep model figure in) on the floor using a chalk or paint marker. Measurements are referenced from the edge of the rotation swivel plate.
- Lay out all the wheel track arcs along the scribed lines which pass over portions of the aeration floor.
- At the positions where butt joints of wheel track arcs are present, tack-weld these joints.
- For only one of the four corners of each of the wheel track arc full lengths which have been tack-welded, anchor the corner to the concrete at the edge of the aeration channel (see). Cut off this anchor as low as possible so as not to interfere with the sweep or wheels.

5.9. Adjust the Alignment of the Front and Rear Wheels

Adjust the front and rear wheels to align with the scribed wheel paths at each radius where they are located. For each wheel, rotate the disk plate overtop of the wheel and position the bolts in the hole settings which enable the angle of the wheel to align with the scribed wheel path on the floor. See Figures [Figure 28](#) and [Figure 29](#).

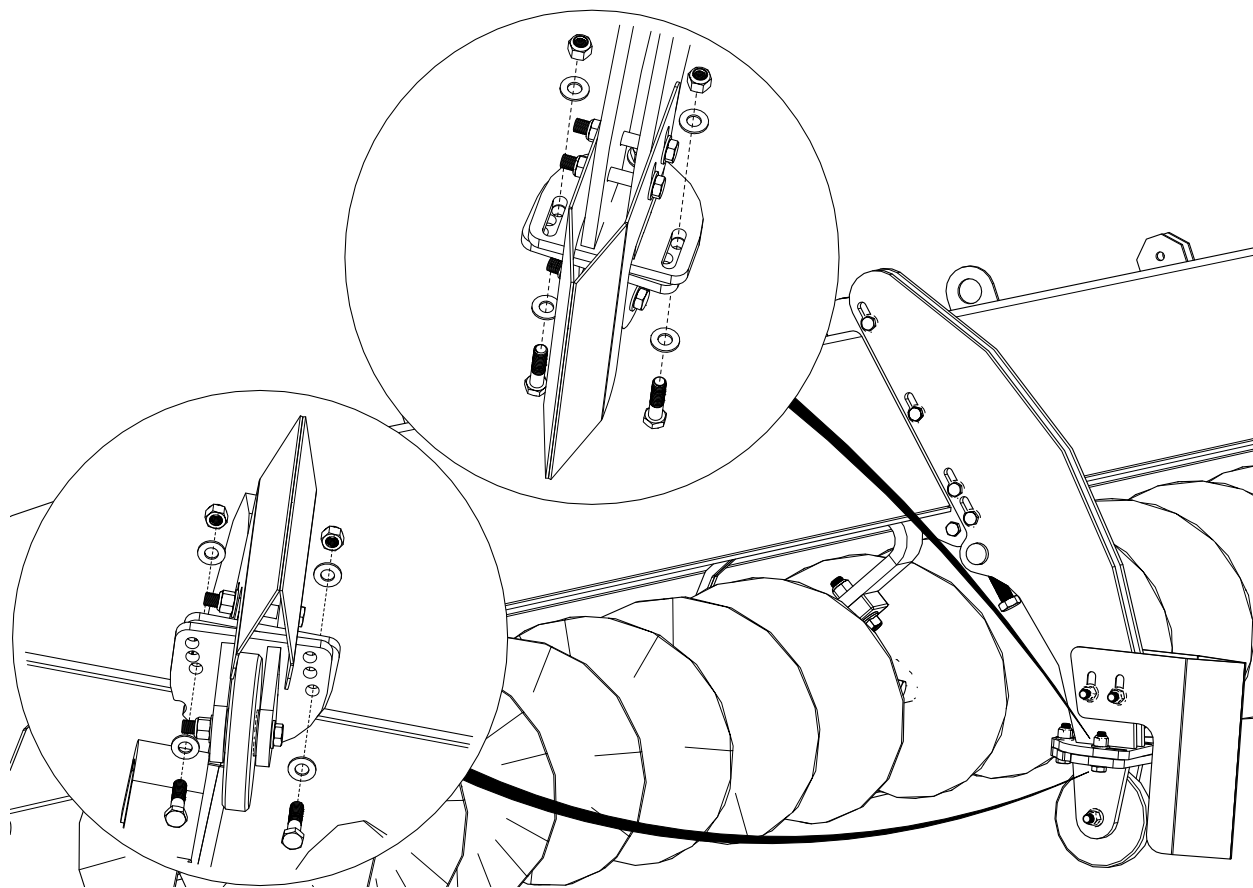
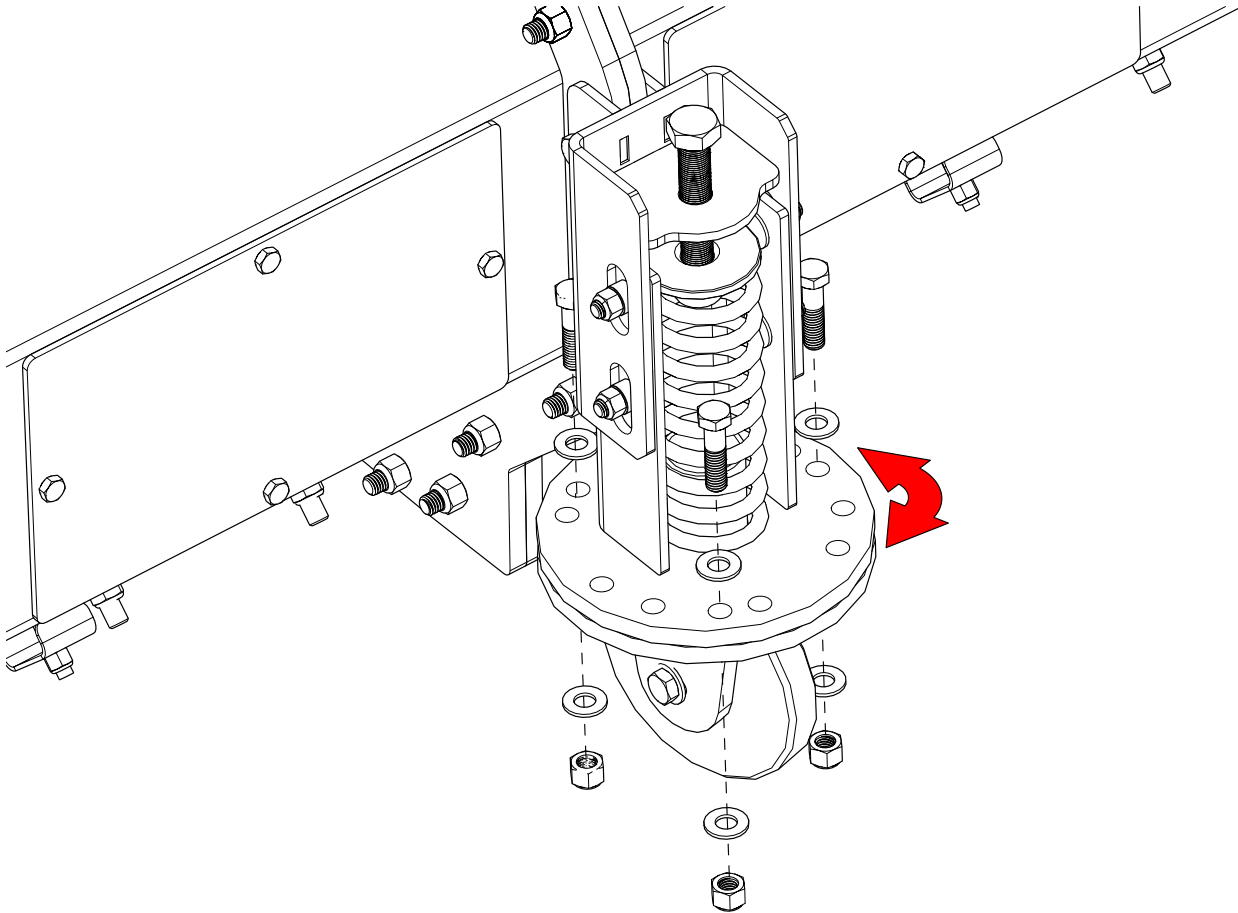
Figure 28. Adjust Alignment of Front Wheels

Figure 29. Adjust Alignment of Rear Wheels

5.10. Install the Angle Drive Track

Important

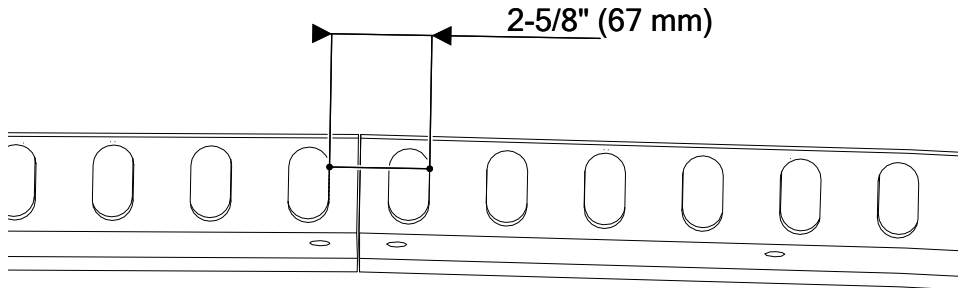
The angle drive track must be level all around the bin. If the aeration floor level is below the concrete floor level, support plates must be installed underneath the angle drive track on the aeration floor to fill the gap.

1. Mark/scribe the drive track line (shown in your respective sweep model figure in) on the floor.

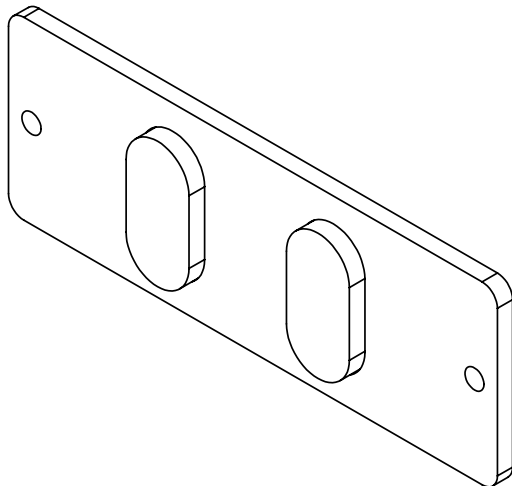
Example (see): $R169'' - R9-13/16'' = 159-3/16''$, or equivalently $R4293 \text{ mm} - R249 \text{ mm} = 4044 \text{ mm}$.

Note

- The drive track line is dimensioned to the outside of the angle drive track.
- At each joint between drive track sections, keep the “slot-to-slot” spacing at exactly $2-5/8''$ (67 mm) (see [Figure 30](#)). The hydraulic track drive’s toothed wheel is designed to smoothly mesh with track at this required spacing. This is more important than the radius of the drive track and may in later steps require that the backboard cutout and fighting notch both be widened to avoid interference with the angle drive track.

Figure 30. Slot-to-Slot Spacing for Angle Drive Track

2. Position the angle drive track sections:
 - a. Lay out all the track sections (except last four sections) with the outside edge along the scribed line.
 - b. Grind/cut the track section ends at each joint as necessary to achieve the exact slot-to-slot spacing of 2-5/8" (67 mm).
 - c. As each joint's spacing is achieved, use the supplied specialized jig (see [Figure 31](#)) to tack-weld the joint.
 - d. Anchor the track sections to the floor with one 1/2" x 5" concrete anchor in the center of each section.

Figure 31. Angle Drive Track Tack-Welding Jig

3. With only four track sections remaining to lay out, estimate if these sections will need to be shifted in or out (increasing or decreasing the radius of the drive track) to keep the 2-5/8" (67 mm) slot-to-slot spacing in all the remaining joints. Similar to [Step 2](#), use the jig to tack-weld these last joints and then anchor these sections.

5.11. Install the Hydraulic Track Drive

1. Remove the track guides from the hydraulic track drive sub-assembly (see [Figure 32](#) and [Table 15](#)).

Figure 32. Remove Track Guides

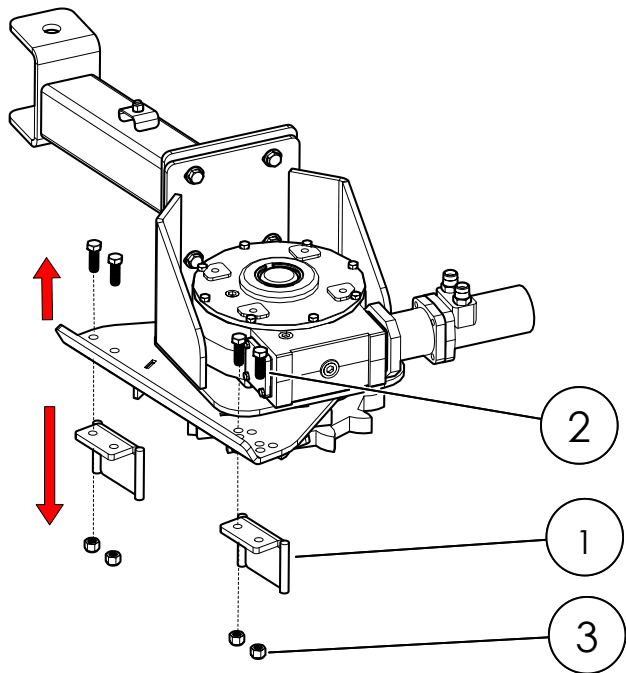


Table 15. Remove Track Guides

Item Number	Part Number	Description	Quantity
1	BU-0500247	TRACK GUIDE WELDMENT	2
2	1002227	HEX BOLT 1/2-13 X 1-1/2"	4
3	33138	NYLON LOCK NUT 1/2-13	4

2. Pin the track drive sub-assembly to the sweep backboard (see [Figure 33](#) and [Table 16](#)).

Figure 33. Pin Hydraulic Track Drive to Sweep Backboard

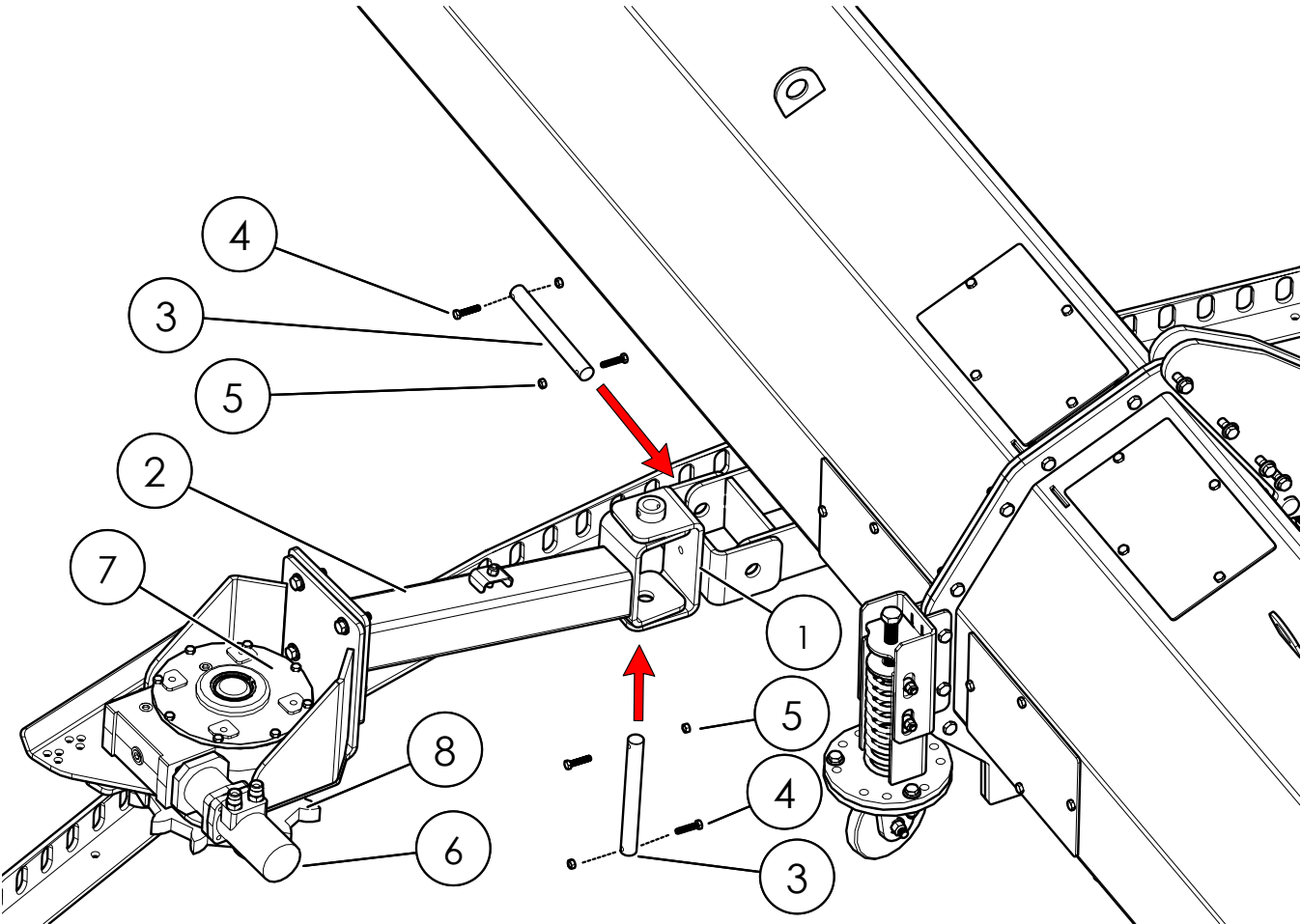


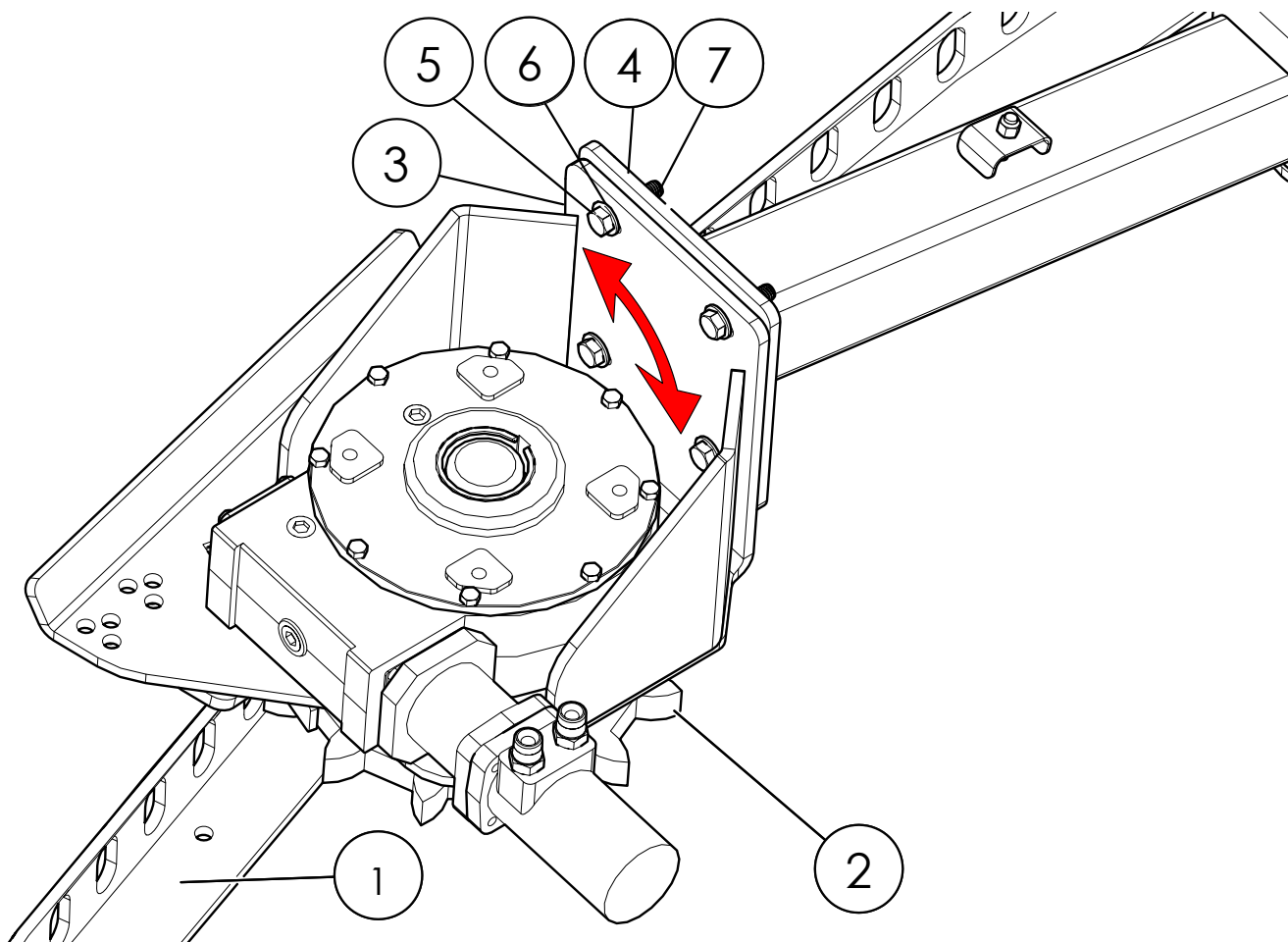
Table 16. Pin Hydraulic Track Drive to Sweep Backboard

Item Number	Part Number	Description	Quantity
1	BU-0500246	SWEEP DRIVE PIVOT WELDMENT	1
2		TRACK DRIVE ARM WELDMENT	1
3	BU-0500233	PIVOT PIN	2
4	1002217	HEX BOLT 5/16-18 X 2-1/2	4
5	33135	NYLON LOCK NUT 5/16-18 ZP	4
6		MOTOR, HYDRAULIC GEROTOR 101-1015-009	included in hydraulic track drive sub- assembly
7		GEARBOX, HYDRAULIC INPUT SWEEP DRIVE, 2.25"	
8		TOOTHED WHEEL, DRIVE TRACK	

- Set the hydraulic track drive onto the angle drive track such that the teeth on the toothed wheel are in the track's slots.

Note

- Make sure the plane of the toothed wheel is parallel to the plane of the bin floor, if necessary by adjustment.
- To adjust: loosen the bolts (see [Figure 34](#) and [Table 17](#)), slightly rotate the two plates (with slotted bolt holes) with respect to one another, and re-tighten the bolts.

Figure 34. Adjustment of Track Drive Sub-assembly**Table 17. Adjustment of Track Drive Sub-assembly**

Item Number	Part Number	Description	Quantity
1		ANGLE DRIVE TRACK	
2		TOOTHED WHEEL, DRIVE TRACK	included in hydraulic track drive sub- assembly
3		GEARBOX HOUSING WELDMENT PLATE	
4		TRACK DRIVE ARM PLATE	
5	1002228	HEX BOLT 1/2-13 X 2"	4
6	33025	FLAT WASHER 1/2"	4
7	33138	NYLON LOCK NUT 1/2"	4

4. Re-fasten the 2 bolts and 2 nuts with the front track guide onto the hydraulic track drive sub-assembly.
5. Re-fasten the 2 bolts and 2 nuts for the rear track guide according to the placement in the holes as shown in [Table 18](#) with the hole identifiers shown in detail view D of [Figure 35](#).

Figure 35. Rear Track Guide Placement in Holes

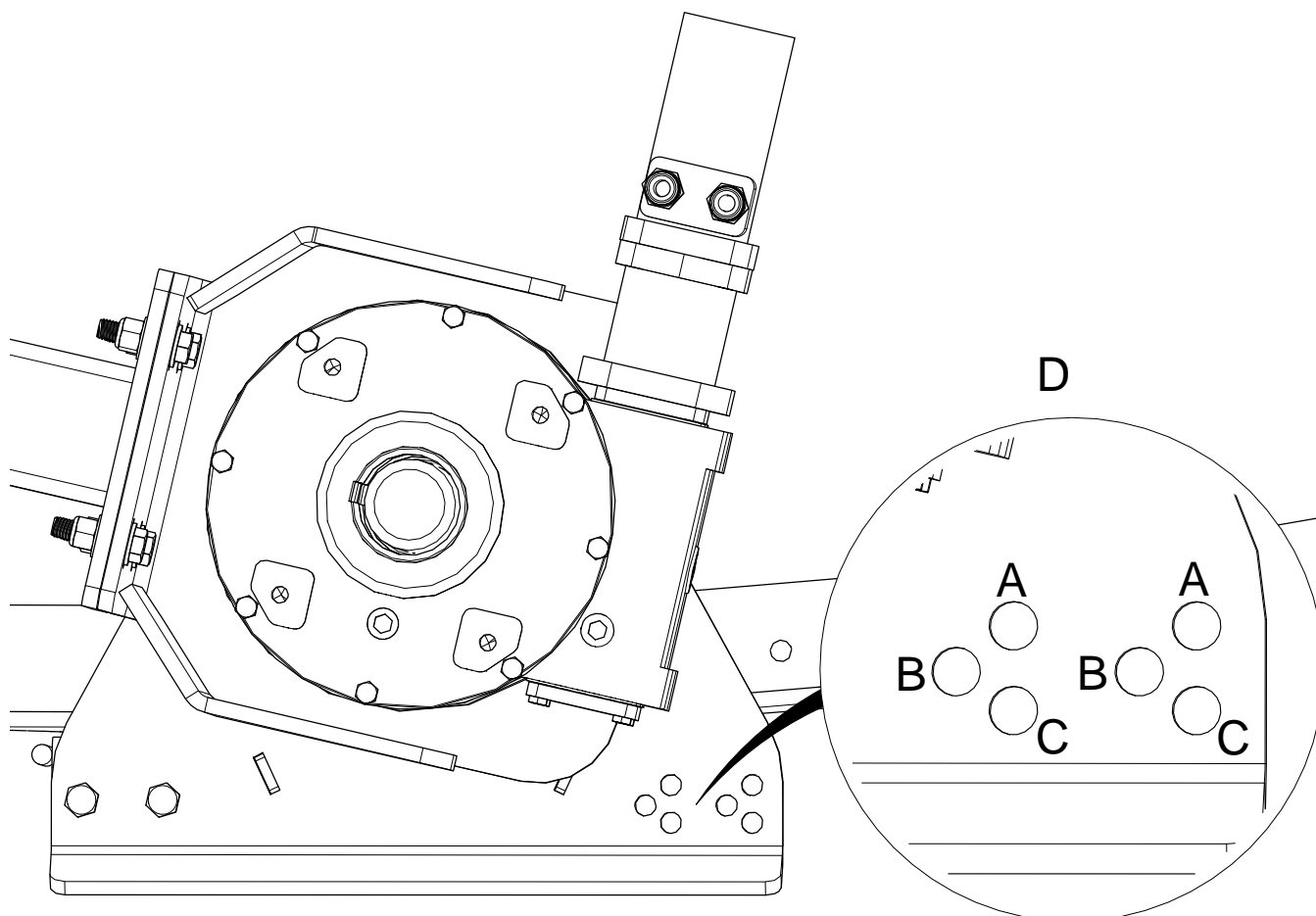


Table 18. Rear Track Guide Bolt Placement

Commercial Sweep Model	Holes
BU-16-48BU-16-48EX	A
BU-16-54BU-16-54EX	
BU-16-60BU-16-60EX	
BU-16-66BU-16-66EX	
BU-16-72BU-16-72EX	B
BU-16-75BU-16-75EX	
BU-16-90BU-16-90EX	
BU-16-105BU-16-105EX	C

6. Plumb two hydraulic hoses (pressure line and return line) from the center sump's upper gearbox bracket along the lower portion of the backboard through the hose clamps and along the track drive arm to the

hydraulic motor (see and [Figure 36](#) and [Table 19](#)). The hose ends with the 90° coupler fittings connect to the track drive hydraulic motor.

Figure 36. Hydraulic Hose Connections at Center Sump Upper Gearbox Bracket

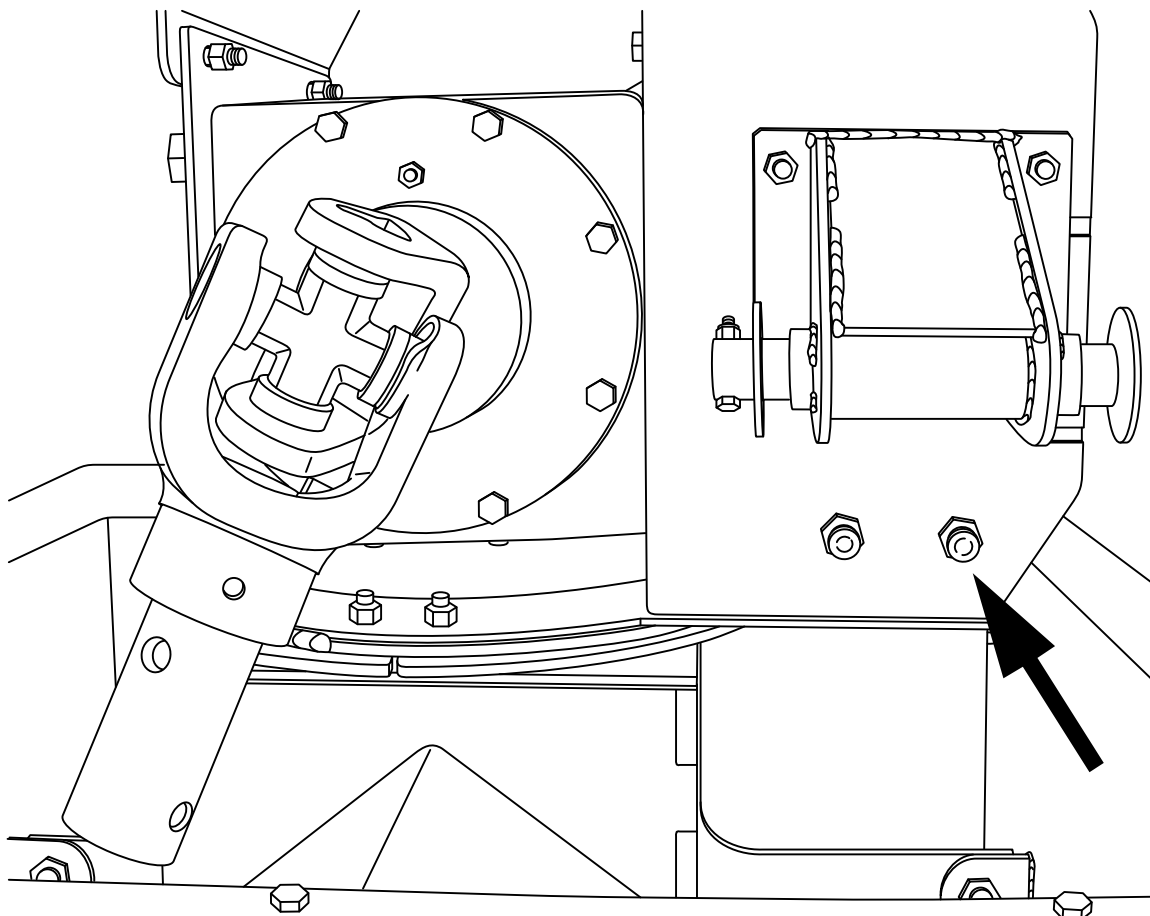


Table 19. Hydraulic Hose Connections at Center Sump Upper Gearbox Bracket

Commercial Sweep Model	Length	Part Number	Quantity
BU-16-48 BU-16-48EX	188"(4775 mm)	BU-0500406	2
BU-16-54 BU-16-54EX	188"(4775 mm)	BU-0500406	2
BU-16-60 BU-16-60EX	188"(4775 mm)	BU-0500406	2
BU-16-66 BU-16-66EX	188"(4775 mm)	BU-0500406	2
BU-16-72 BU-16-72EX	332"(8433 mm)	BU-0500439	2
BU-16-75 BU-16-75EX	332"(8433 mm)	BU-0500439	2
BU-16-90 BU-16-90EX	332"(8433 mm)	BU-0500439	2
BU-16-105 BU-16-105EX	476"(12 090 mm)	BU-0500446	2

- Make sure all bolts, nuts, and hardware assembled thus far are tightened according to their specifications.

8. Make sure there are no obstructions along the sweep's path along the bin floor.
9. Use the NECO control panel to operate the sweep as described below. Before applying pressure to the hydraulic system, make sure all hoses and couplings are tight.
 - a. In Auto local control state, move the sweep 3 ft (1 m) forward.

Important

If the sweep moves in reverse instead of forward, the hydraulic hoses are connected incorrectly at the proportional directional control valve. Shut down and lock out all power sources, and correct the hose connections.

- b. Move the sweep further forward until all air has been purged from that hydraulic circuit.
 - c. In Manual local control state, move the sweep in reverse until all air has been purged from that hydraulic circuit.
 - d. Shut off and lock out power to the sweep.
 - e. Add sufficient hydraulic oil to the tank to regain the middle level in the sight gauge to make up for air displaced from hoses. Do not overfill.
10. Inspect the equipment (especially hydraulic hoses and fittings) for evidence of oil leaks and cracks.

6. Functional Testing and Completion



Before continuing, ensure you have completely read and understood this manual's Safety section, in addition to the safety information in the section(s) below.

6.1. Functional Testing Safety

WARNING

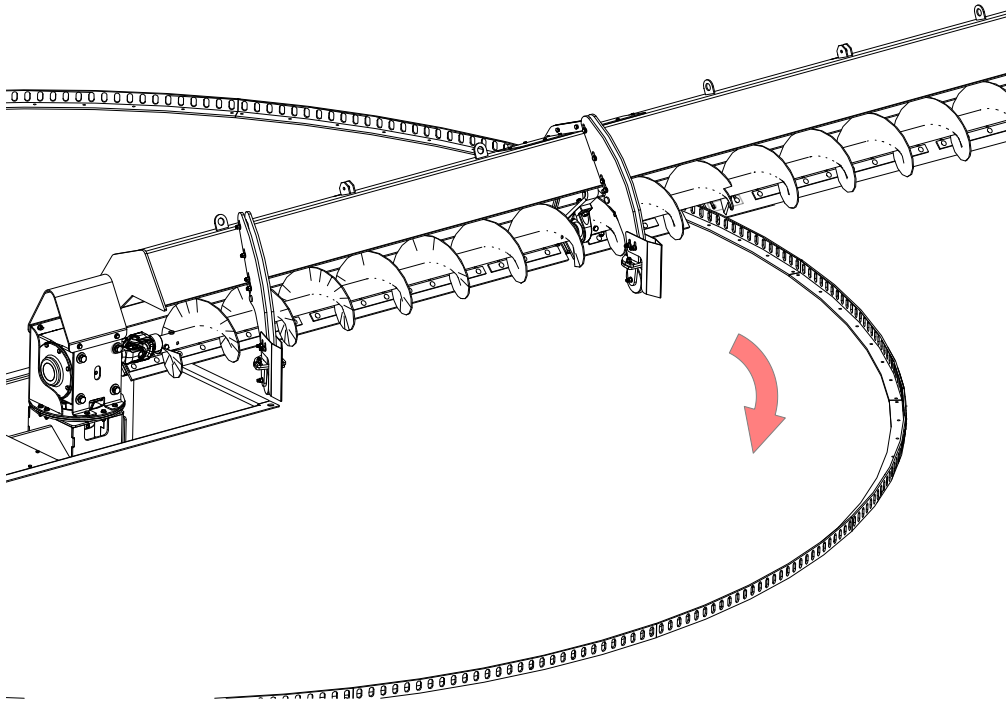
- Keep away from rotating and moving parts, including the auger/mixer flighting, drive components, shafts, and bearings.
- Always operate with guards, covers, and shields in place.
- Shut down and lock out power before adjusting the equipment. Never attempt to move or perform any adjustments on the equipment manually with your hands, feet, or similar bodily means or with tools during functional testing.
- Have another trained person who can monitor the functional testing, shut down equipment and call for help in case of emergency.
- Keep the work area clear of bystanders.
- Keep the work area clean and free of debris.
- Make sure you have sufficient lighting for the work area.

6.2. Functional Testing of Hydraulic Track Drive

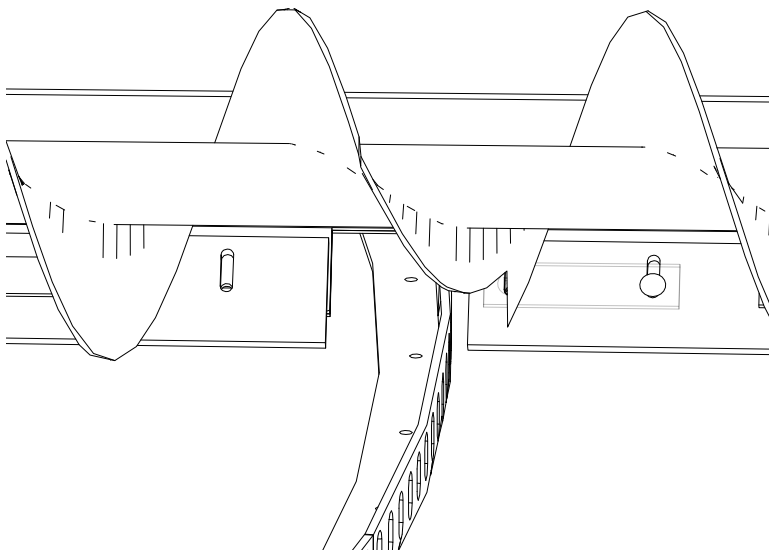
1. Ensure there are no obstructions in the center sump, sweep's flighting, or sweep's path along the bin floor.
2. Use the NECO control panel to set the local control mode to Manual state.
3. Use the panel Tractor controls to begin to move the sweep slowly through one full revolution forward around bin (see [Figure 37](#)).

WARNING

Never adjust the pressure relief valve. It is set at 1500 psi (10 300 kPa) and must remain at that setting to avoid injury or equipment damage. If a problem with excessively slow operation of the sweep is encountered, the solution is NOT adjusting the pressure relief valve to increase the pressure. The root cause of the problem is elsewhere in the equipment system(s) and should be investigated for a solution by referring to the Troubleshooting chapter in the AGI Commercial Bin Sweep 500 Series Operation Manual.

Figure 37. First Test Revolution Around Bin

4. During testing, pay attention to any problems in the function of the hydraulic track drive system:
 - a. Ensure the angle drive track has sufficient clearance from the edges of the backboard cutout and the flighting notch.
 Ideally, the anchor bolt holes on the drive track should remain approximately in the center of the backboard cutout and flighting notch (see [Figure 38](#)).

Figure 38. Clearance and Centering Checks for Angle Drive Track

- b. Watch to make sure that the wheels stay on their scribed paths across the concrete floor and in the middle of their tracks across the aeration floor. They should not suddenly jerk sideways while rolling along their path.

- c. Observe the clearance between the backboard's lower rubber strip and the concrete floor. The ideal clearance should be 1/2" (13 mm).
 - d. Observe the end of the sweep around the whole bin and note the position in its revolution which has the minimum clearance to the bin wall, also accounting for the bin's inner wall parts. This minimum clearance will later be used to adjust the sweep extender.
5. After the full test-run, stop the sweep. Proceed to lock out the power to the sweep.

6.3. Final Anchoring of Tracks

Wheel Track Arcs

1. Make any necessary final positioning adjustments to the track arcs.
2. Where the butt joints of the track arcs were tack-welded, now fully weld these joints. While welding, use a small spacer underneath the track joint to protect the concrete floor.



Concrete chunks can explode from the floor if too much heat is applied in a small area.

Use spacer as specified in [Step 2](#) and wear proper PPE including a welding helmet, gloves, and coveralls.

3. Use an angle grinder to bevel all leading and trailing edges of the tracks to allow the sweep wheels move onto and off of the plates smoothly.
4. Secure the remaining 3 out of 4 corners of each track to the concrete at the edge of the aeration channel using concrete anchors.
5. Cut off the anchors as low as possible so that the nuts and bolt heads will not be in the path of the wheels.

Angle Drive Track

1. Make any necessary final positioning adjustments to the track sections, while maintaining the 2-5/8" (67 mm) slot-to-slot spacing.
2. If the track's clearance to the backboard cutout and flighting notch is still less than 1/8" (3 mm), it is necessary to widen the backboard cutout and flighting notch to ensure there is no interference.
3. Fully weld all joints of the track sections. While welding, use a small spacer underneath the track joint to protect the concrete floor. All these welded joints must be ground flush and smooth.



Concrete chunks can explode from the floor if too much heat is applied in a small area.

Use spacer as specified in [Step 3](#) and wear proper PPE including a welding helmet, gloves, and coveralls.

4. Secure the drive track to the floor with concrete anchors; 4 per track section.

Important

Make sure that the wheel tracks and angle drive track are sufficiently secure throughout their length across the aeration floor to prevent lifting during sweep operation. Any additional means of securing are at the installer's discretion.

5. If any wheels were jerking sideways, make necessary adjustments to align with the scribed wheel paths. See for adjustment.

6.4. Set the Backboard Clearance

Adjust the bolts on the backboard's lower rubber strip to ensure the concrete floor clearance is approximately 1/2" (13 mm).

6.5. Adjust the Sweep Extender

Adjust the sweep extender (see [Figure 39](#)) to maximize the amount of grain picked up by the end of the sweep:

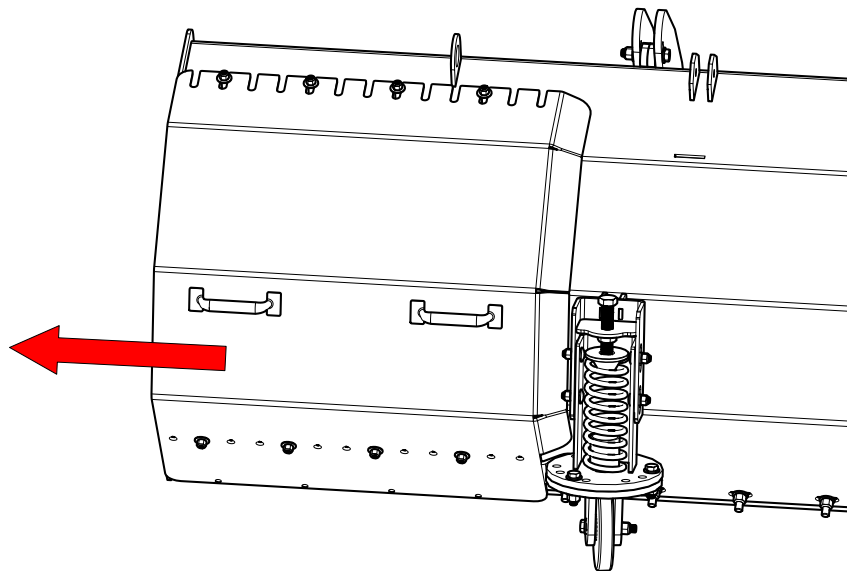
1. Remove the 4 locknuts (3/8") and 4 flat washers on the bottom of the extender.
2. Slide the extender off the 4 bolted connections on top.
3. Move the extender outward to the same length as the minimum clearance between the end of the sweep and the bin wall (and attached parts), as observed during the full test-run revolution. Maximum adjustment = 16" (406 mm).

Important

For the BU-16-75 and BU-16-75EX sweep models, it is mandatory that the sweep extender be adjusted outward at least 15" (381 mm) to function as a backboard for the 15" (381 mm) fighting section at the end of the sweep.

4. Slide the extender back onto the bolted connections on top.
5. Re-fasten the nuts and flat washers on the bottom.

Figure 39. Adjust Sweep Extender



6.6. Functional Testing of Whole System (including Sweep Flighting)

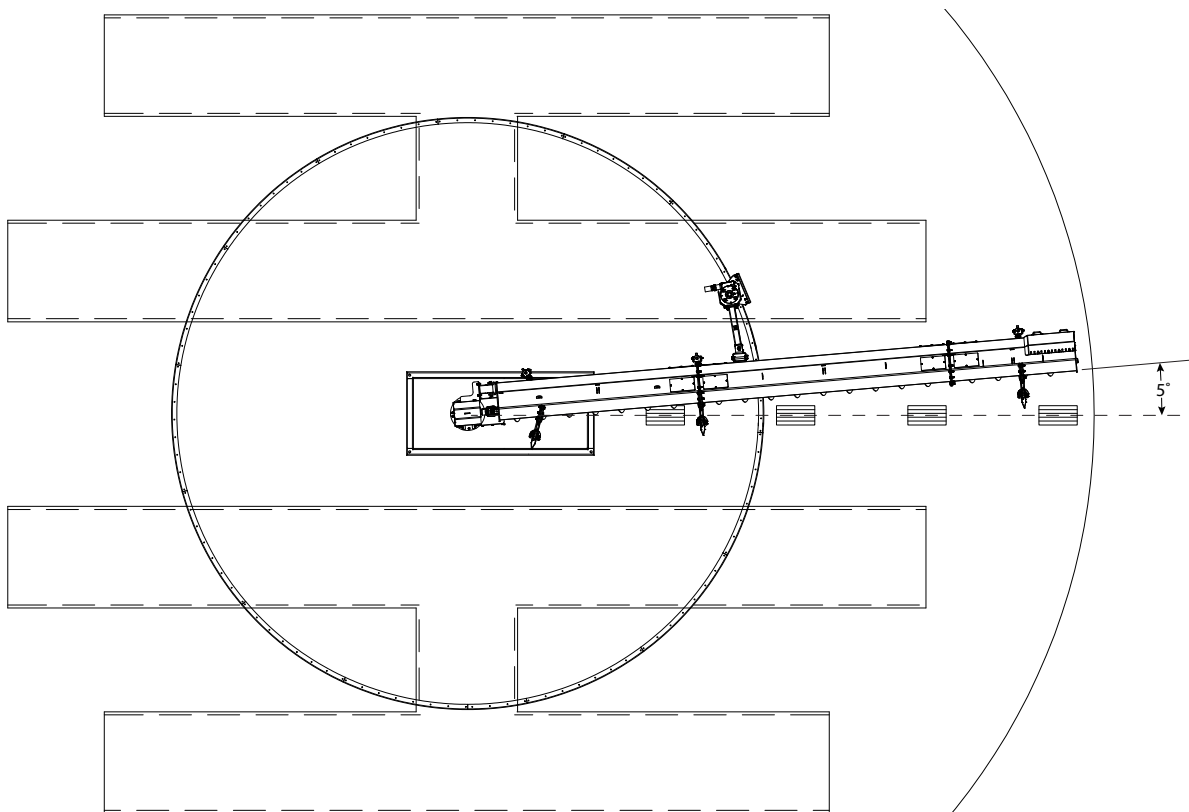
1. Perform another test-run (revolution around bin) while operating both the sweep's track drive hydraulic system and the sweep flighting. Start the electric motor in the center sump to run the sweep's flighting.

Important

When starting the sweep flighting for the first time, be prepared for an emergency shutdown in case of excessive vibration or noise. This problem is likely caused by driveline misalignment between the electric motor and lower gearbox in the center sump and can be solved by adjusting the "torque stop pin" on the driveline, which adjusts the lower gearbox angle for proper alignment. For other issues, refer to the Troubleshooting chapter in the AGI Commercial Bin Sweep 500 Series Operation Manual.

- a. During testing, along with checking the general function of the whole sweep, especially monitor to ensure no anchor bolts or nuts from the wheel track arcs and the drive track are interfering with the lower rubber strip on the backboard, nor the flighting.
- b. Once proper functional operation has been verified, move the sweep to the "park position" (see [Figure 40](#); slightly behind intermediate sumps with front and rear wheel sub-assemblies on solid concrete bin floor).
- c. Shut down and lock out all power sources.

Figure 40. Start/Park Position for Sweep



2. Ensure all structural fasteners are secure.
3. Inspect the equipment (especially hydraulic hoses and fittings) for evidence of oil leaks and cracks.

7. Specifications

7.1. Overhead Layouts for Sweep Models

Note

- The double-H aeration pattern in [Figure 41](#) to [Figure 48](#) is shown as an example. Your aeration pattern may differ.
- In each model in [Figure 41](#) to [Figure 48](#), one size of center sump is shown (either Standard or Extended) as an example. Your particular center sump may have the other size (either Extended or Standard).

Figure 41. Overhead Layout for BU-16-48 and BU-16-48EX Models

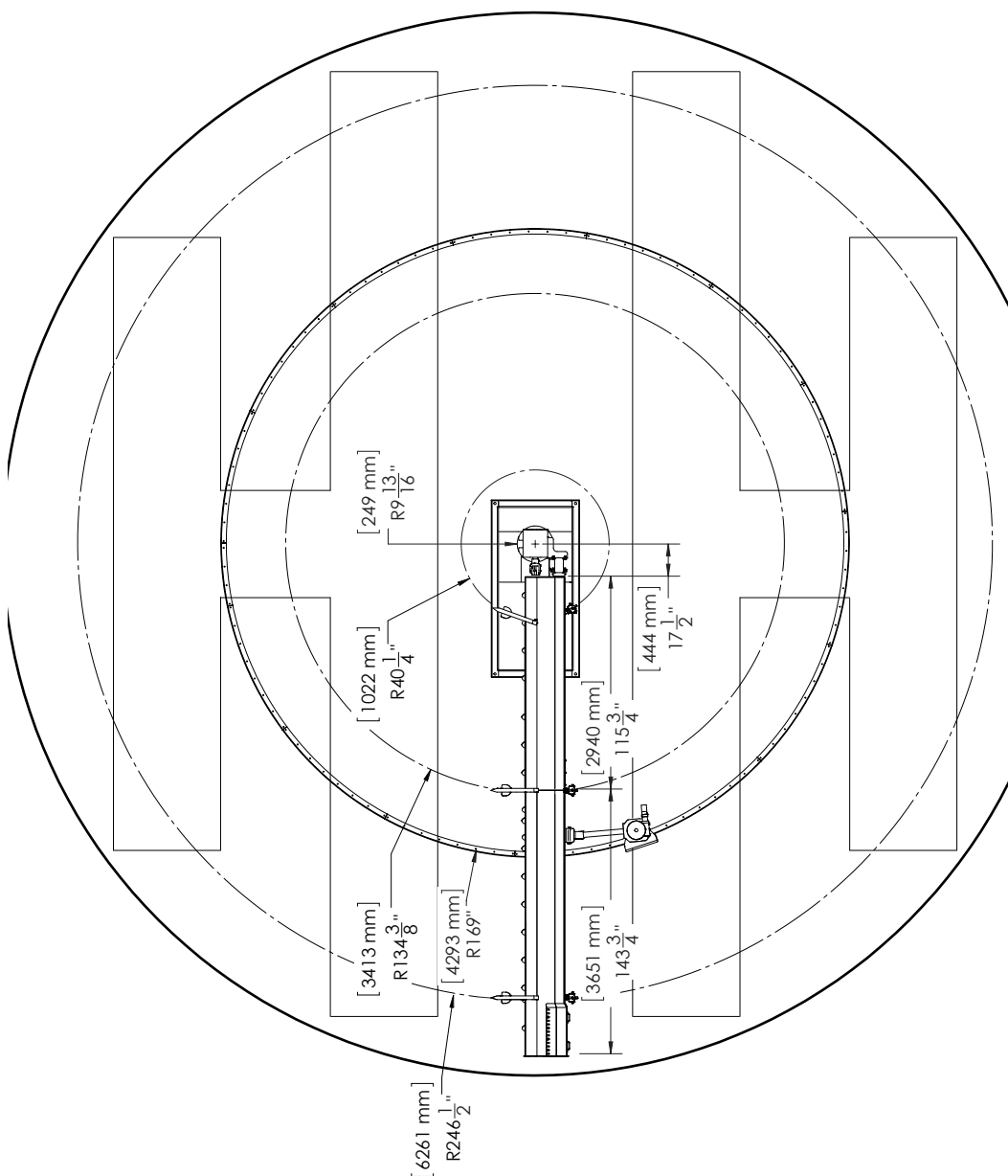


Figure 42. Overhead Layout for BU-16-54 and BU-16-54EX Models

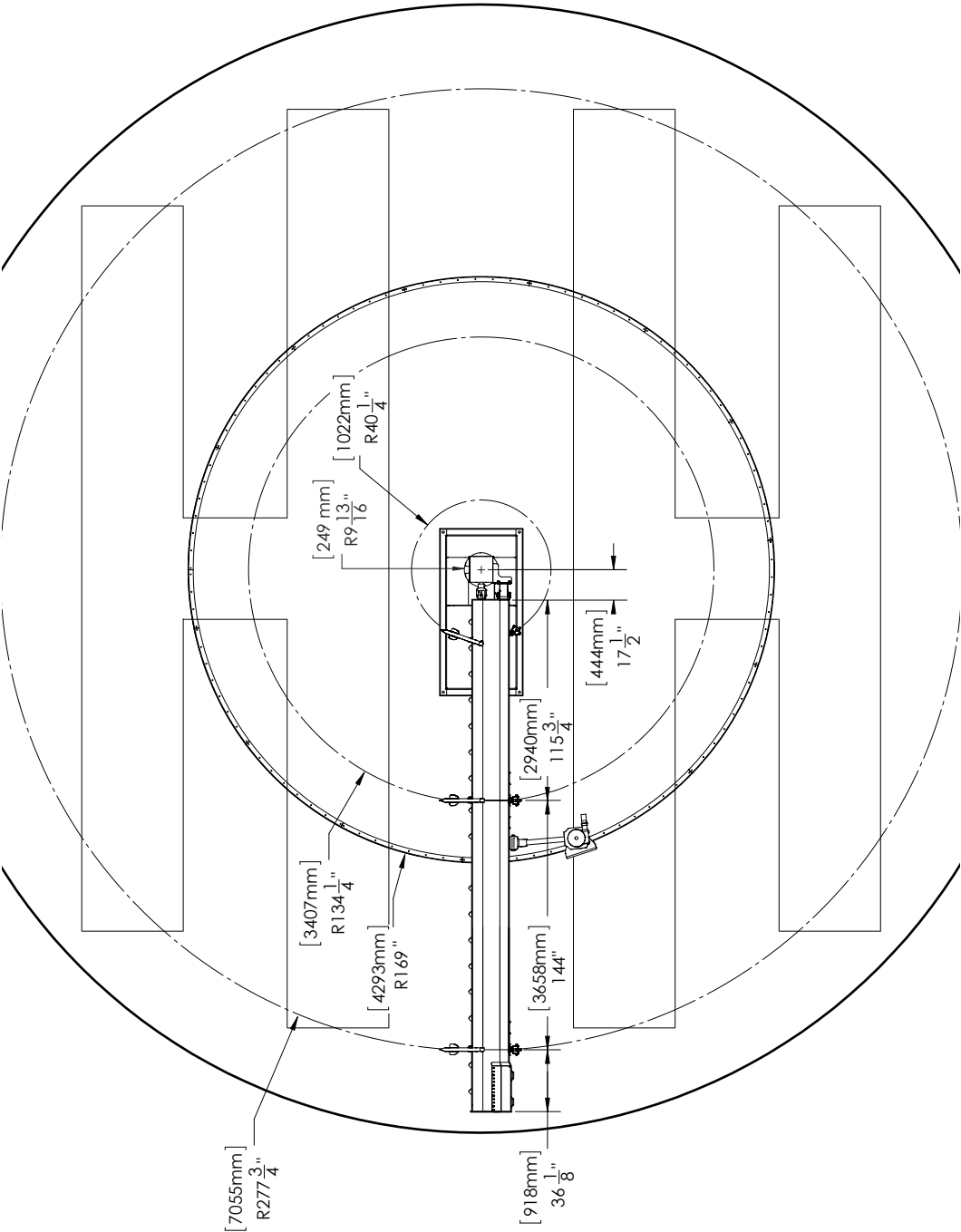


Figure 43. Overhead Layout for BU-16-60 and BU-16-60EX Models

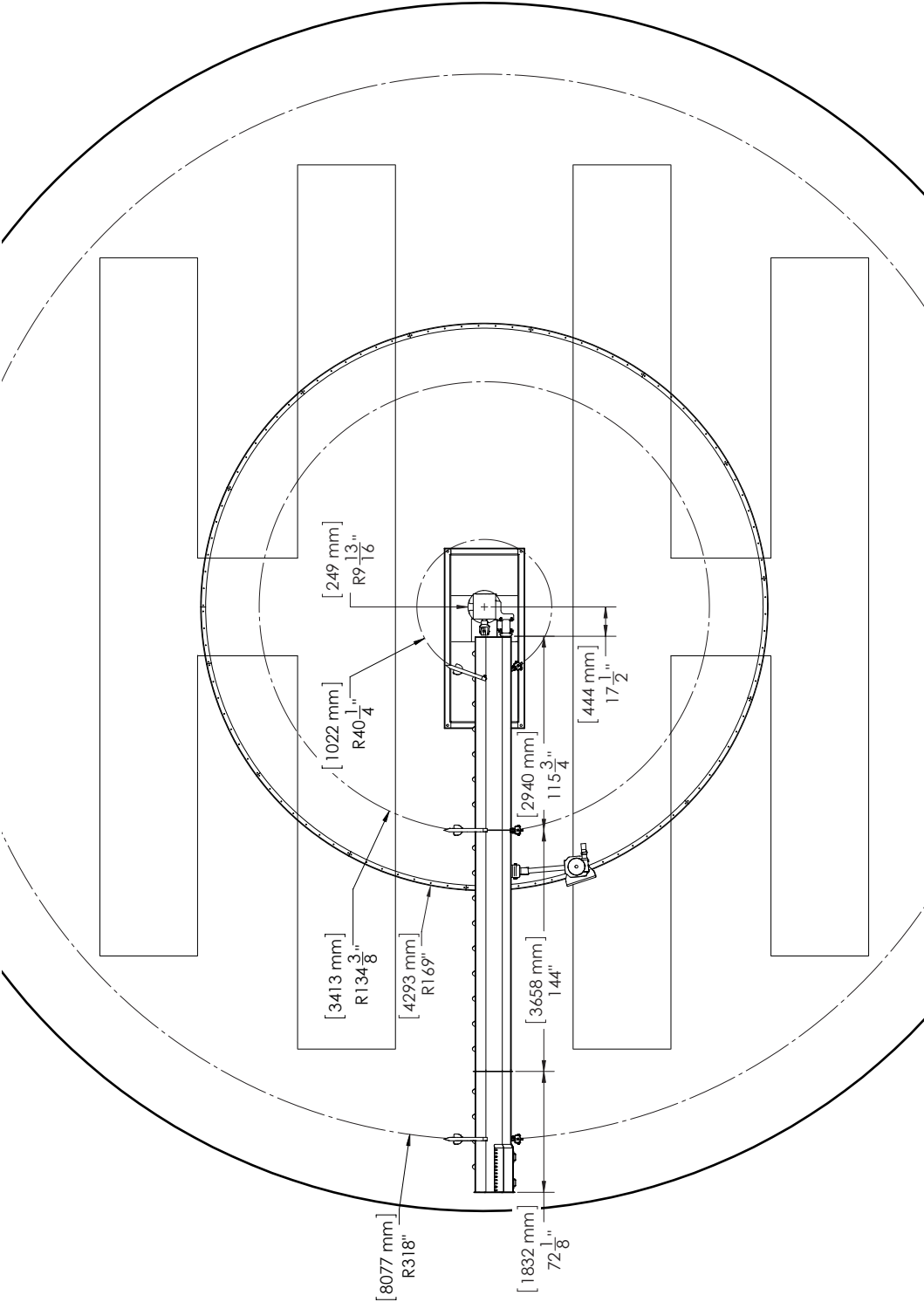


Figure 44. Overhead Layout for BU-16-66 and BU-16-66EX Models

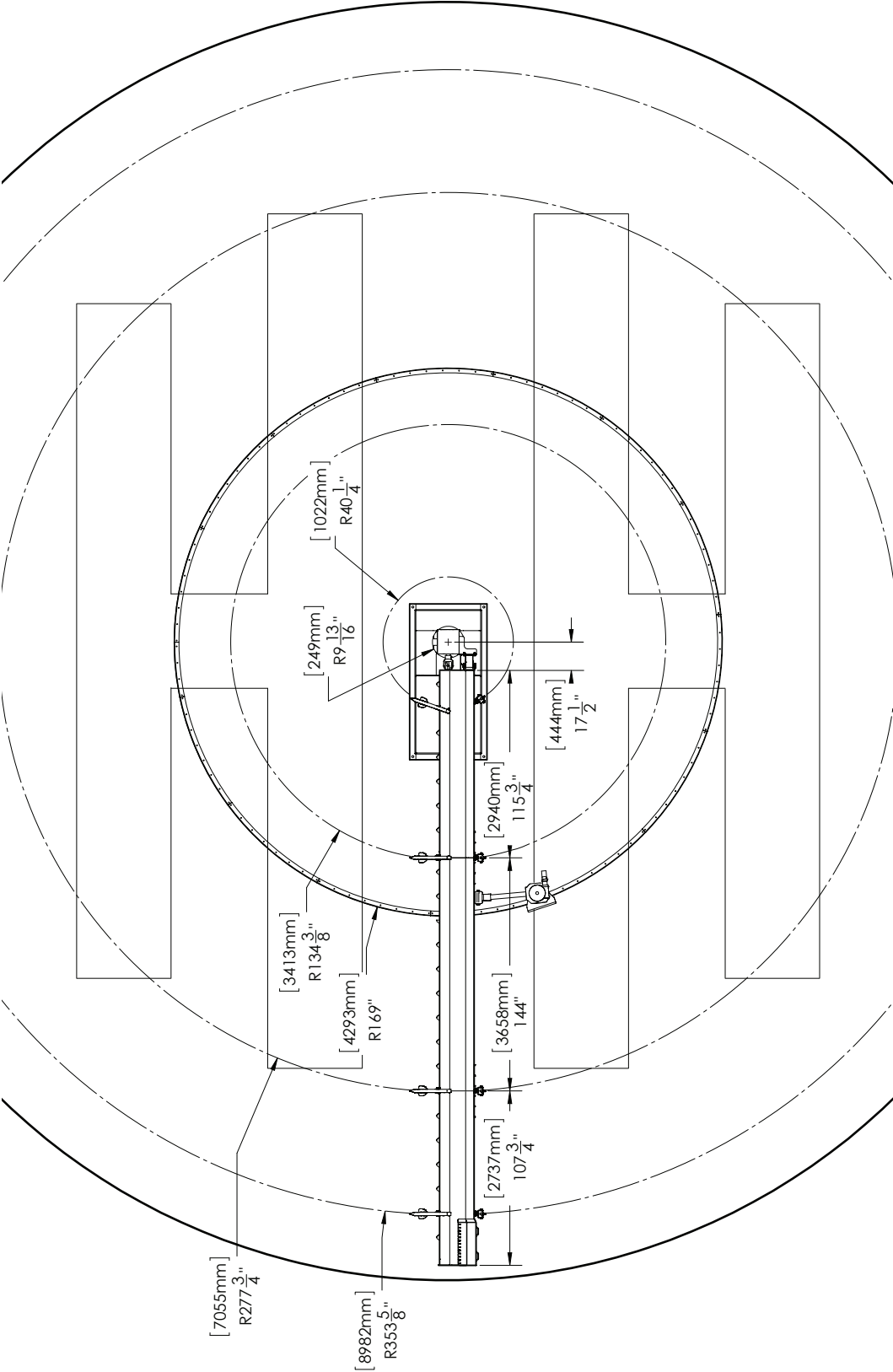


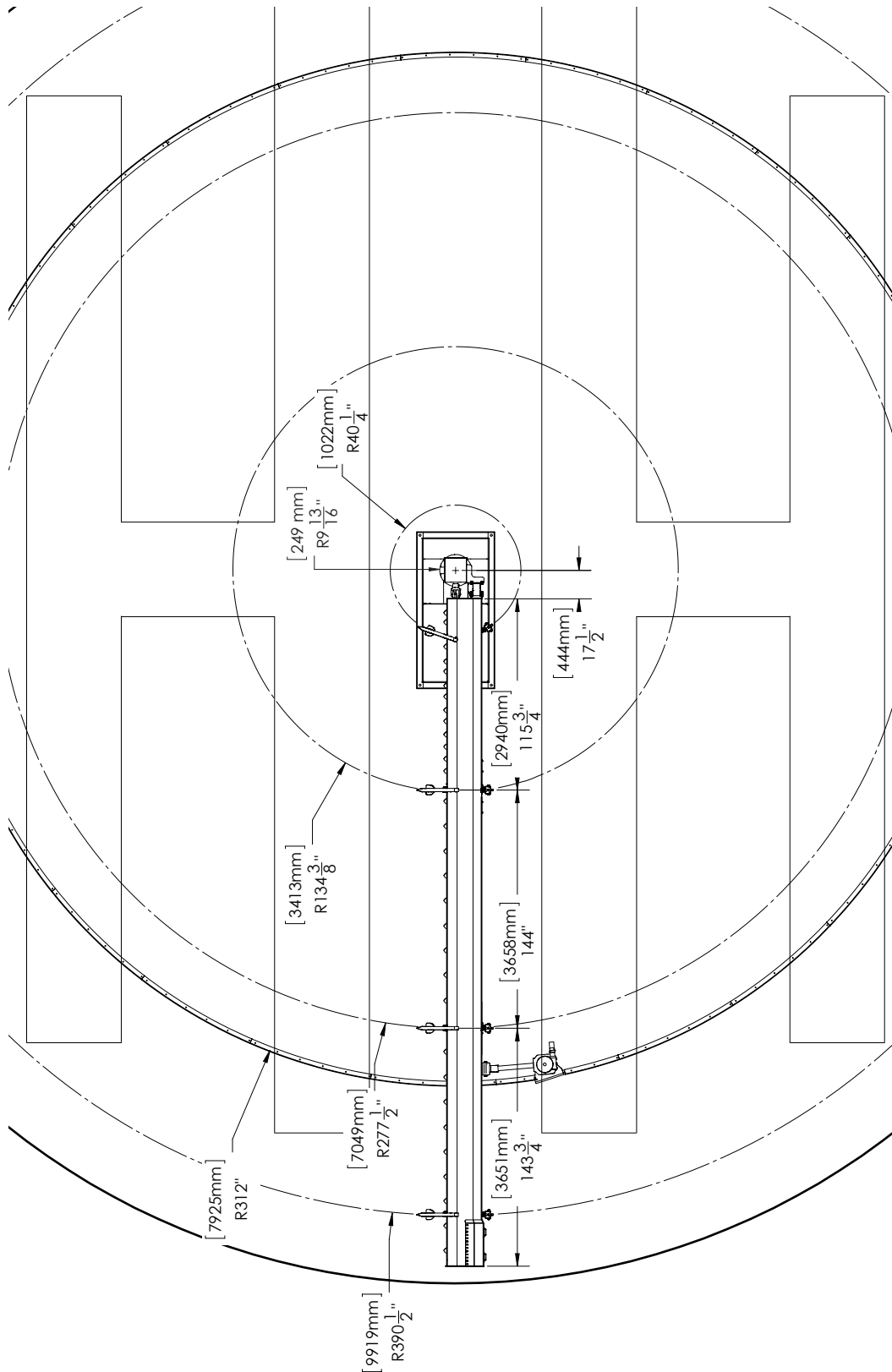
Figure 45. Overhead Layout for BU-16-72 and BU-16-72EX Models

Figure 46. Overhead Layout for BU-16-75 and BU-16-75EX Models

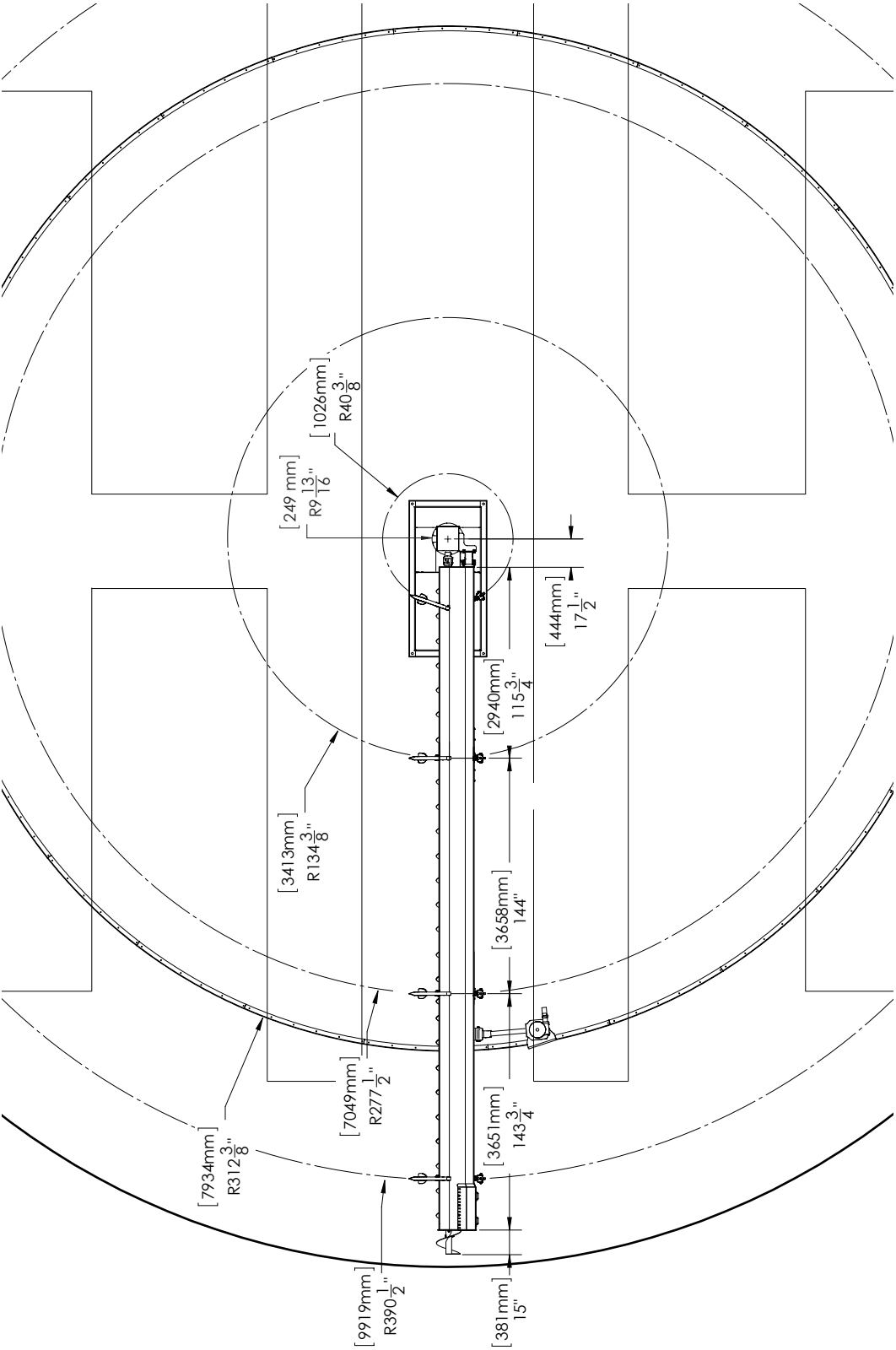


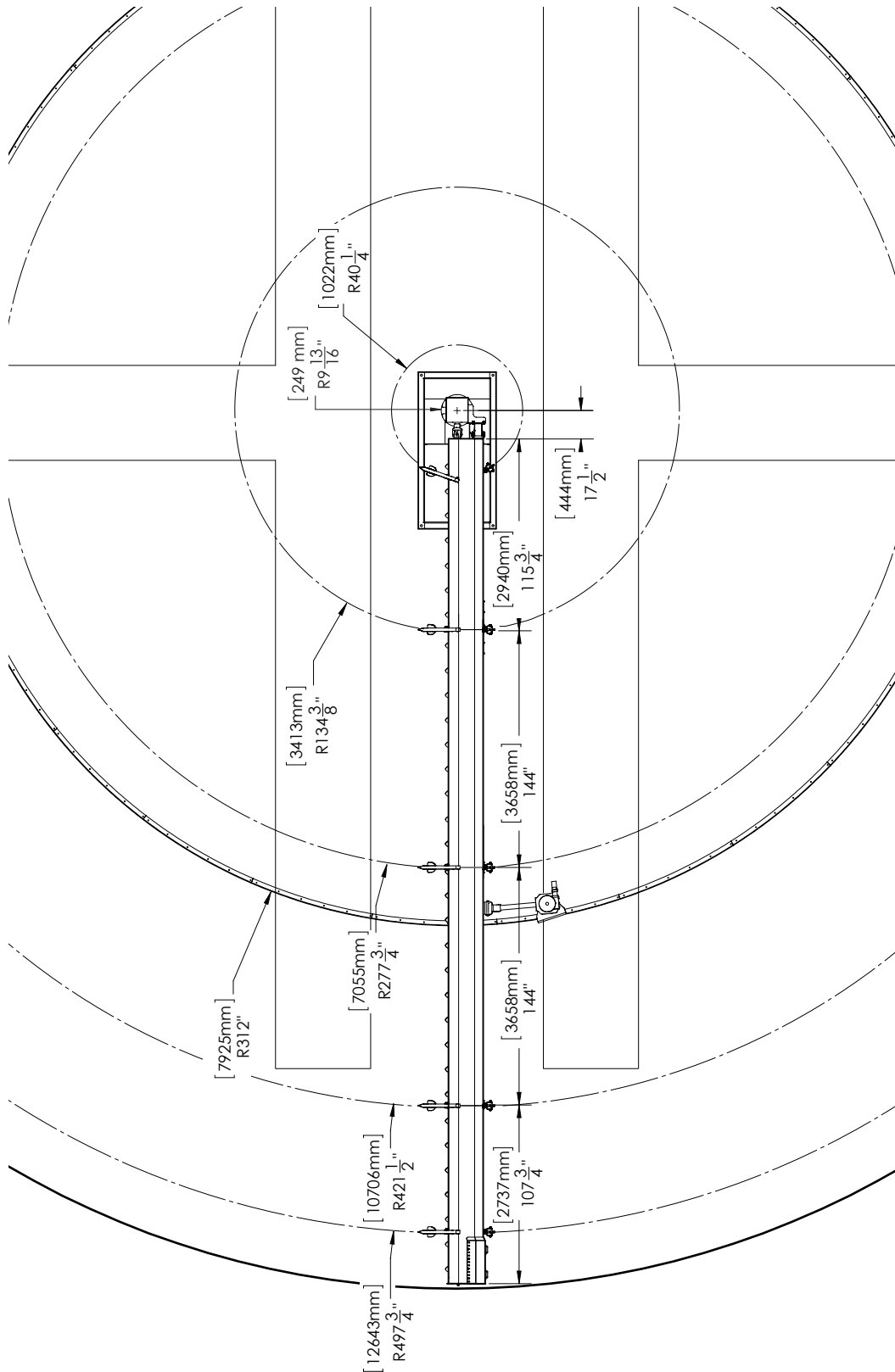
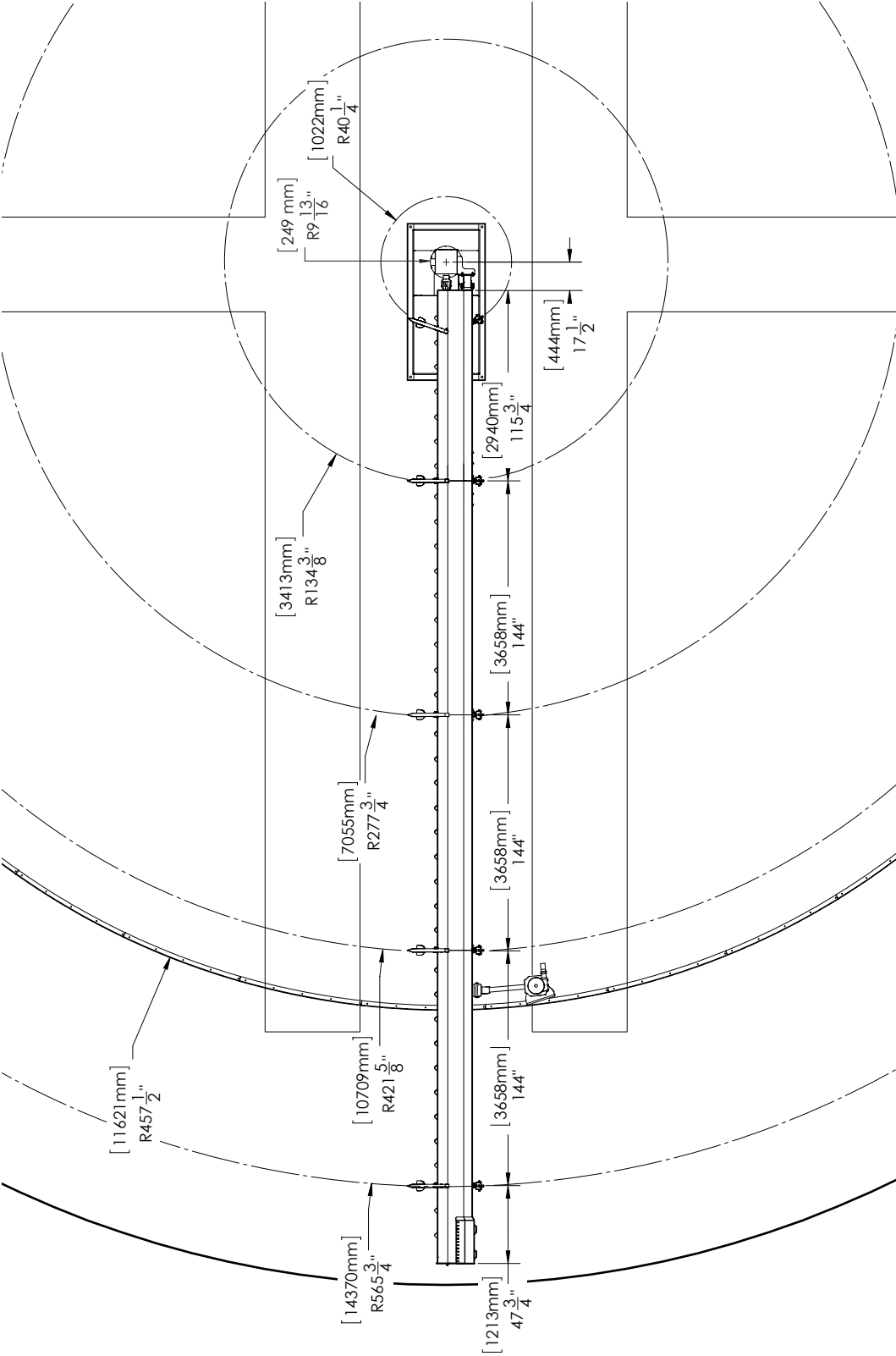
Figure 47. Overhead Layout for BU-16-90 and BU-16-90EX Models

Figure 48. Overhead Layout for BU-16-105 and BU-16-105EX Models







8. Appendix

8.1. Bolt Torque

Table 20 gives the correct torque values for various hardware. Tighten all bolts to the torque specified, unless otherwise noted. Check tightness periodically, using Table 20 as a guide. Replace the hardware with the same strength bolt, contact AGI if you are unsure.

Table 20. Recommended Bolt Torque¹

Size	Dry or Lubricated	Threads per inch (Course/Fine)	Area of Bolt (sq in.)		Recommended Torque (ft-lb)							
					 Grade 2		 Grade 5		 Grade 8		 8.8 S/S	
			Coarse	Fine	Coarse	Fine	Coarse	Fine	Coarse	Fine	Coarse	Fine
1/4"	Dry	20/28	0.0318	0.0364	5.5	6.3	8	10	12	14	6.3	7.8
	Lubricated				6.3	4.7	6.3	7.2	9	10	-	-
5/16"	Dry	18/24	0.0524	0.058	11	12	17	19	24	27	11	11.8
	Lubricated				8	9	13	14	18	20	-	-
3/8"	Dry	16/24	0.0775	0.0878	20	23	30	35	45	50	20	22
	Lubricated				15	17	23	25	35	35	-	-
7/16"	Dry	14/20	0.1063	0.1187	32	36	50	55	70	80	31	33
	Lubricated				24	27	35	40	50	80	-	-
1/2"	Dry	13/20	0.1419	0.1599	50	55	75	85	110	120	43	45
	Lubricated				35	40	55	65	80	90	-	-
9/16"	Dry	12/18	0.182	0.203	70	80	110	120	150	170	57	63
	Lubricated				55	60	80	90	110	130	-	-
5/8"	Dry	11/18	0.226	0.256	100	110	150	170	210	240	93	104
	Lubricated				75	85	110	130	160	180	-	-
3/4"	Dry	10/16	0.334	0.373	175	200	260	300	380	420	128	124
	Lubricated				130	140	200	220	280	310	-	-
7/8"	Dry	9/14	0.462	0.508	170	180	430	470	600	670	194	193
	Lubricated				125	140	320	350	180	180	-	-
1"	Dry	8/14	0.606	0.679	250	280	640	720	910	1020	287	289
	Lubricated				190	210	480	540	680	760	-	-
1-1/8"	Dry	7/12	0.763	0.856	350	400	790	890	1290	1440	288	290
	Lubricated				270	300	590	670	970	1080	-	-
1-1/4"	Dry	7/12	0.989	1.073	500	550	1120	1240	1820	2010	289	291
	Lubricated				380	420	840	930	1360	1510	-	-
1-1/2"	Dry	6/12	1.405	1.581	870	960	1950	2200	3160	3560	-	-
	Lubricated				650	730	1460	1640	2370	2670	-	-

1. Torque value for bolts and cap screws are identified by their head markings. Established at 75% of yield strength of bolt given the cross-sectional area.

Note

Torque figures in table are valid for non-greased or non-oiled threads and head unless otherwise specified. Therefore, do not grease or oil bolts or cap screws unless otherwise specified in this manual. When using locking elements, increase torque values by 5%.



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